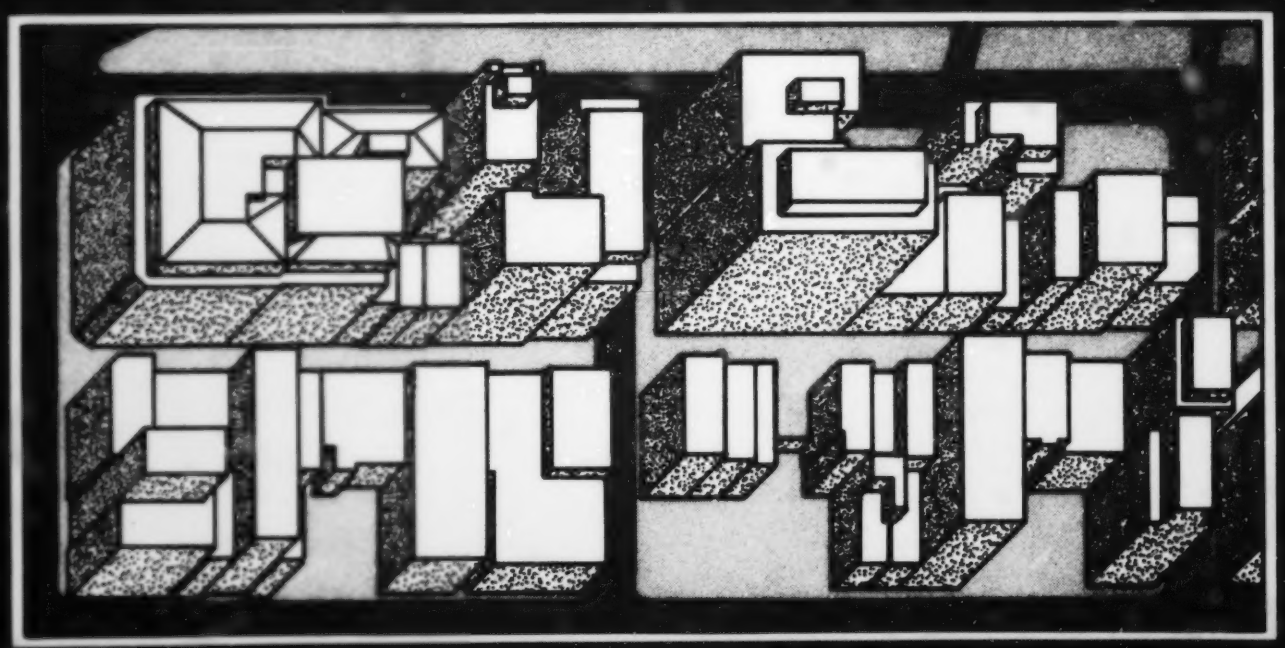
Sparks Street Economic Study

Prepared for The City of Ottawa

Prepared by DPA Consulting Ltd.
in association with Aecop Associates

August, 1983



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SPARKS STREET
ECONOMIC STUDY

Prepared for:

City of Ottawa

Prepared by:

DPA Consulting Ltd.
in association with
Arcop Associates,
Caruscan Corp. and
Coughlan Management
Inc.

ACKNOWLEDGEMENTS

On behalf of the study team DPA Consulting Ltd. wishes to acknowledge the substantial contribution of the many individuals and groups with whom we had discussions while preparing this study. In particular, the Sparks Street Environmental Study Committee was most co-operative in offering comments and opinions on the future of the Sparks Street Mall and the most appropriate form of development for the study blocks. City staff members were very helpful in providing information and comments during the course of the study. As well, many individuals from other government agencies and the private sector assisted in the study by providing essential information in a timely and co-operative manner. Finally, we wish to thank the many citizens who contributed to the study by participating in the Sparks Street Mall pedestrian study.

We have found that there are a variety of deeply felt concerns about the future of the Sparks Street Mall which we have attempted to take into account in this study. The analyses and resulting conclusions presented in this report, however, remain our sole responsibility.

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EXECUTIVE SUMMARY

This report was commissioned by the City of Ottawa to test the financial, economic, retail and environmental impacts of a proposed zoning bylaw change for two blocks on the south side of Sparks Street Mall located between Bank and Metcalfe Streets. The proposed zoning bylaw would limit building heights on the Sparks Street Mall to 45 feet (13.7 meters) and heights for the remainder of the blocks through to Queen Street to heights limited by the location of a 26 degree angle drawn from the 45 foot (13.7 meters) height limit.

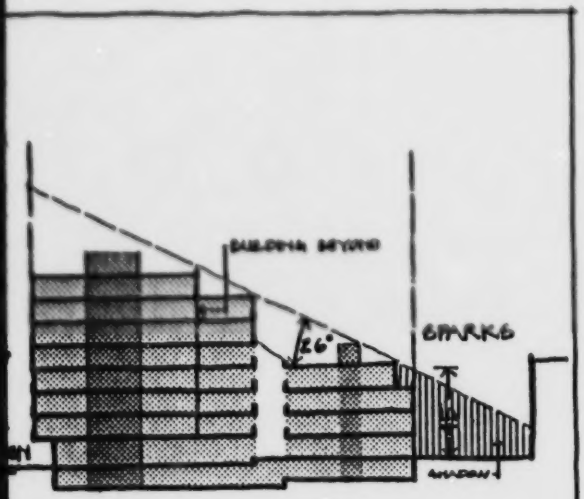
STUDY APPROACH

The analysis of impacts required the preparation of building concepts based on various land assembly and zoning policy options. The previous bylaw applicable to the study blocks, which permitted densities up to an 8.0 floor space index was selected as the base case for the study. The City's proposed 45 ft.(13.7m)/26 degree zoning policy was selected as a bylaw option which most restricted development. An additional intermediate zoning policy option of 45 ft.(13.7m)/38 degrees selected by the study team was also considered.

Two land assembly options were analyzed, one with one full block assumed available for redevelopment and the second with representative redevelopment in selected parcels in each of the two blocks. Building concepts and associated floor spaces were thus prepared for the six combined options. Exhibit 1 shows illustrative designs for each zoning policy option on site 2W - the Woolworths site. In addition renovation options were considered for three sites fronting on the Mall (Toronto-Dominion, Zellers and Simpsons).

The financial and fiscal analyses were conducted using a computer model developed by DPA Consulting Ltd. The financial analysis was based on a residual land value methodology using standard land development information and assumptions. The fiscal analysis involved calculation of the net benefits to the

IBIT 1: SITE 2W - ZONING POLICY OPTIONS



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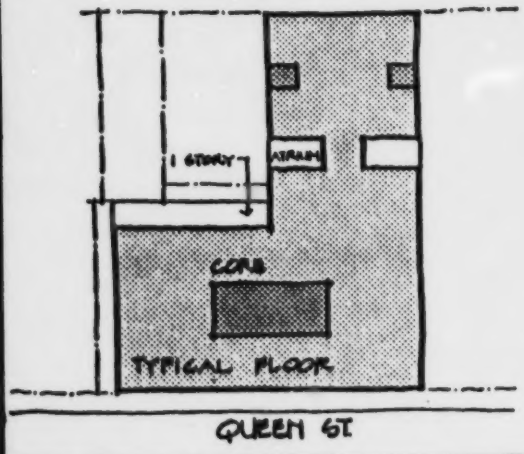

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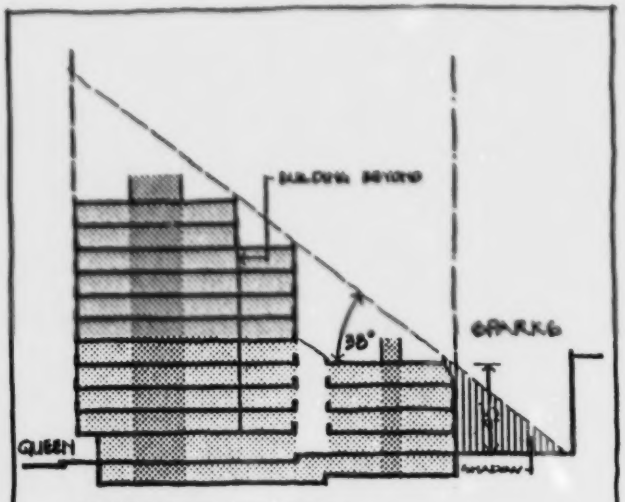

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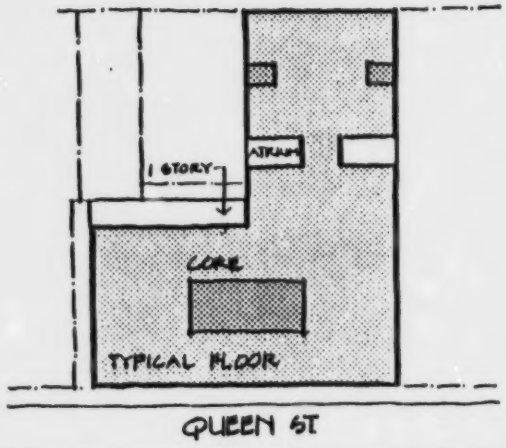

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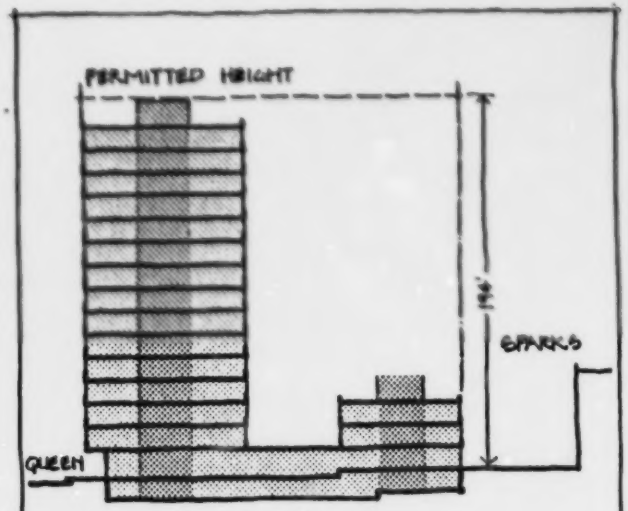

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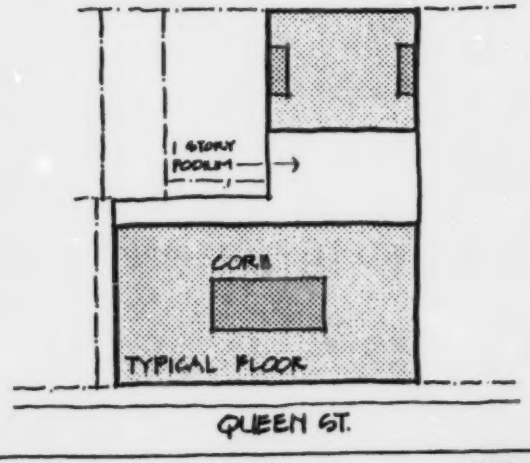


SITE 2W C-2/8.0 0 40'

municipality directly attributable to redevelopment in the study blocks. As well demographic and traffic impacts associated with each option were estimated.

The impacts on retail trade were estimated based on three variables - a net increase in retail floor space, the effects of net increases in employment in the study blocks, and tne impacts of quality redevelopment and associated environmental impacts. Estimates of the employment-related effect on retail trade were based on a survey of pedestrians on the Sparks Street Mall undertaken in the Fall of 1982. In addition to these impacts, the impact of Rideau Centre on Sparks Street Mall retailing was analyzed, based on the City of Ottawa's SCOPE model.

Environmental effects were assessed based on changes in sunlight penetration to the Mall and wind effects associated with each of the zoning policy options.

Finally the analysis benefitted from several discussions held with members of the Sparks Street environmental study committee (a committee of interested merchants, landlords and interest groups), City officials, real estate and development industry representatives and other interested agencies.

SUMMARY OF FINDINGS

The selection of an appropriate policy for the study blocks should depend on the role which the City adopts for the Sparks Street Mall. In discussions with the Sparks Street environmental study committee and City representatives several possible roles emerged including a quality retail area, a financial and office district, a major shopping area and a quality urban open space area with associated retail and entertainment facilities. Each of these and other possible roles for the Mall imply different development regulations to accomplish the objectives embodied in these roles. Our findings on the impacts of various zoning bylaw options should be considered in the context of the role selected

for the Sparks Street Mall. Exhibit 2 summarizes the impacts of the three zoning policy options on property owners, the municipality, merchants and Mall users. These are discussed below.

General Economic Impacts

A reduction in the quality of the Mall environment with full development under the C-2/8.0 option would reduce the attraction of the Mall for pedestrians and ultimately diminish the importance of the Mall as a shopping and tourist attraction and as an interesting open air urban space. This, in turn, would have negative impacts on other shopping areas in Central Area West and would not be supportive of strategies to enhance the area's attractiveness to shoppers and visitors alike.

Full development under the C-2/8.0 zoning option is likely to result in significant reductions in tourism-related retail expenditures. There will be no negative impacts on employment and incomes generally in Central Area West although there may be some reductions in retail employment due to reduced sales per square foot performance.

High Density Versus Restricted Density Development

One of the key questions in this study is the set of tradeoffs that must be considered in allowing either high-density development (the C-2/8.0 zoning option) or restricting the density of development (the 45 feet(13.7m)/26 degree, 45 feet(13.7m)/38 degree and similiar options).

Exhibit 3 summarizes our findings expressed as tradeoffs which the City should consider in the course of determining the appropriate development control policy. As a general matter permitting the highest density development (C-2/8.0) favours property owners through potential for retaining and/or enhancing property values. It also enhances the City's fiscal position

EXHIBIT 2: SUMMARY OF IMPACTS

INTEREST GROUP	BYLAW 45/26 DEGREE	45/38 DEGREE	C-2/8.0
Property Owner	Residual Land Values drop well below current market prices representing a maximum potential of $16.5 Million (64%) decrease from market value	Residual Land Values are approximately in line with current market prices. Potential for more value if retail Mall environment is enhanced	Residual Land Values are significantly above current market prices representing approximately $24.3 Million (94%) increase above market value
Municipality	While the direct net revenues to the Municipality from the Mall would not be as great as in C-2/8.0 revenues from other city core areas would probably increase to offset this	While the direct net revenues to the Municipality from the Mall would not be as great as in C-2/8.0 revenues from other city core areas would probably increase to offset this	Highest direct net revenue from the Mall. High intensity development on Mall may reduce development elsewhere in the core
Merchants	Greatest negative impact is Rideau Centre which reduces sales per square foot by about 14%. Increase in sales per square foot due to employment lowest of the three options at about 10% increase.	Greatest negative impact is Rideau Centre. Positive employment-related effect is about 15% and quality/environment related effect could result in highest overall positive impact on Mall retail activity	Greatest negative impact is Rideau Centre. Increase in sales per square foot due to employment increase is highest (about 17%). There will be decline in sales/sq.ft. due to environment effect
Mall Users	Good environmental conditions conducive to shopping and strolling. No adverse sunlight or wind conditions	Similar to 45/26 degree except that in late autumn and winter months not as much sun exposure on Mall	Loss of sunlight on Mall all year round. Potentially disturbing wind conditions due to high buildings

EXHIBIT 3: SUMMARY OF TRADEOFFS - HIGH DENSITY VERSUS RESTRICTED DENSITY

Item	ZONING POLICY	
	High Density	Restricted Density
Primary Benefit Areas	. property owners . City fiscal position	. public . retail merchants . City
Qualifications	. land value is potential only-dependent on land assembly and development conditions . no financial impact on City since development would occur elsewhere based on demand	
Tradeoffs	. significant reduction in quality of Mall environment would: - result in decreases in shoppers expenditures not offset by additional employment - cause losses in tourism retail expenditures - fail to distinguish Mall as interesting, active retail and pedestrian area - diminish the focus the Mall provides to Central Area West - diminish the general attractiveness of Central Area West for shopping vis-a-vis Rideau Centre/Byward Market	. reductions in development potential would: - reduce potential returns to property owners - create possible disincentives to development - reduce potential employment-related retail expenditure

although revenues from the development would be achieved in any case from other locations. These advantages must be weighed against the disadvantages associated with a reduction in the quality of the Mall environment.

The restricted density alternative does not favour the property owner. On the other hand, the maintenance and enhancement of the Mall environment offers advantages in supporting retail activity and maintaining the character of the Mall as an active, enjoyable pedestrian area and tourist attraction.

Financial Impacts - Redevelopment

The financial impact estimates discussed below assume that the developments will take place immediately and this may in fact not be realistic. For instance, it is unlikely that land assembly is possible in the west block given the number of private property owners. Thus, the estimates of the property value decrease must be considered a maximum with actual differences of property value likely to be a lower figure give the qualifications on land carrying costs, parking and likelihood of redevelopment. Finally the estimates shown are total property value differences over the life of the redevelopment.

Maximum Potential Property Value Differences to Property Owners

	Assembly Option			
Zoning Policy	Partial	(% change)	Full Block	(% change)
Current Market Value Base (at $150 per sq.ft.)	$22.7 M	(base)	$25.9 M	(base)
45 ft/26 degree	- 11.6	(- 51)	- 16.5	(- 64)
45 ft.38 degree	+ 5.0	(+ 22)	+ 2	(+ 8)
C-2/8.0	+ 23	(+101)	+ 24.3	(+ 94)

The 45 ft.(13.7m)/26 degree zoning policy option is the least attractive option financially when weighed against the benefits of more intense development possible under the other zoning options. The financial impacts on property owners would be to reduce residual land values to well below current market prices as shown in the table below. This is likely to discourage redevelopment in the study blocks. The 45 ft.(13.7m)/38 degree zoning option results in residual land values which are marginally greater than current land values in the study area. The residual land values in the C-2/8.0 zoning option are significantly greater than current market prices.

Financial Impacts - Renovation

Renovation alone is not financially attractive if one has to account for purchase of the building. Of course, it may be argued that some existing owners, having already written down their buildings, could pursue a feasible renovation project. As well there may be business interests who would pay a premium for a Mall location, irrespective of the economics of renovation.

The renovation/redevelopment combination generally has considerably more potential financially, specifically for the angular zoning options. Pursuing a combined renovation/redevelopment project could improve the financial attractiveness of developments under these options. Certainly for the 45 ft.(13.7m)/38 degree option it could result in a sound proposition in today's market.

Fiscal Impacts

On a strict accounting basis, the municipality achieves the highest net revenues from the Mall under the C-2/8.0 zoning option (see table below).

Annual Municipal Net Financial Benefits (000's)

Zoning Policy	Assembly Options: Partial	% change	Assembly Options: Full Block	% change
Existing Tax Revenues	$ 1009.9	(base)	$ 1354.8	(base)
45 feet, 26 degrees	+ 378.5	(+ 34)	+ 250.7	(+ 19)
45 feet, 38 degrees	+ 668.9	(+ 61)	+ 587.6	(+ 43)
C-2, 8.0	+1012.7	(+ 92)	+1043.5	(+ 77)

The absolute revenue to the municipality will probably remain the same regardless of the extent of development controls on Sparks St. Under the assumptions used in the model, the maximum net revenue difference to the municipality from the Mall would be a reduction of about $650,000 per year. Again, this estimate must be adjusted downward by taking into account where the development would go if it did not go on the Mall. It is likely, even if less development occurs on the Mall, that the excess space which could not be accommodated there could probably be placed in other parts of the Ottawa Central Area.

Environmental Impacts

There is little difference in sunlight penetration to the Mall for both the 45 ft.(13.7m)/26 degree and 45 ft.(13.7m)/38 degree zoning options in the February to October period. The 45 ft.(13.7m)/26 degree option ensures a greater amount of sunlight penetration to the Mall in the October to February period but this is of marginal benefit since this period has a smaller

percentage of sunlight per day as compared to the February to October time period. With full block development under the C2/8.0 zoning policy options sunlight penetration to the Mall would be significantly affected even during the summer months, with the potential that the Mall environment would become a less attractive or distinctive area for strolling and shopping.

Retail Impacts

The impacts of the redevelopment options on retail trade are primarily related to two conditions - the amount of local trade based on employment population in the study blocks and the Mall environment. Retail sales due to employment changes can be expected to increase by 10% for the 45 feet(13.7m)/26 degree option, 13% for the 45 ft.(13.7m)/38 degree option and 17% for the C-2/8.0 option. Taking impacts on the Mall environment into account the 45 ft.(13.7m)/38 degree option has the greatest positive impact on retail trade. The 45 ft.(13.7m)/26 degree and the C-2/8.0 options have less positive impact. The 45 ft.(13.7m)/26 degree has the smallest net increase in employment offsetting its environment advantages. The C-2/8.0 option advantages through employment changes are offset by impacts on the environment and therefore on retail sales.

The greatest impact however, is from Rideau Centre, estimated to result in a 14% decline in retail sales. The variety of retail and support services offered in the combined Rideau Centre/Byward Market shopping area will be a disincentive to east/west pedestrian movement. Thus any loss in the Mall's attractiveness to shoppers will reduce the Mall's competitiveness relative to Rideau Centre.

SUMMARY OF CONCLUSIONS

Mall Role

The Sparks Street Mall fulfills a unique function in Ottawa's urban fabric. It provides a focus to the Central Area with it's retail opportunities, concentration of financial institutions; location close of Parliament Hill, design sympathetic to the pedestrian, and space available for outdoor activities. As such the Mall is a nationally known feature of the City. When one thinks of Ottawa several images come to mind; Parliament Hill, the Rideau Centre, Sparks Street Mall and Byward Market among them. The significance of the Mall as an important element of Ottawa, the city, cannot be overlooked.

Therefore the nature of development which the City permits in the study blocks must be considered in the context of potential impacts on the perception of the Mall by residents in the Ottawa area and the visiting public. Just as there is an opportunity to enhance the current role and perception of the Mall through the type of development growth and change that is permitted there is also the potential to diminish it's importance.

As indicated previously, the appropriate zoning policy should be dependent upon the role selected for the Sparks Street Mall. The combination of discussions we have had and the analysis we have undertaken leads us to believe that the most appropriate role is one which combines the attributes of a financial and office district with high quality retail facilities and supporting restaurants and entertainment.

High Density Versus Restricted Density Development

We conclude that the City should adopt a zoning policy which permits development that enhances the position of the Mall as an attractive, interesting and active shopping and pedestrian area while offering a reasonable return on investment. We believe

that a C-2/8.0 zoning policy is inconsistent with this objective.

Zoning Policy

Based on the role we believe appropriate for the Mall, we conclude that the 45 ft.(13.7m)/26 degree and C2/8.0 zoning policy options are not appropriate for controlling development on the south side of Sparks Street Mall between Bank and Metcalfe Streets. However we do conclude that the City's proposed zoning policy structure (a height limit and building envelope defined by an angle from permitted heights on Sparks Street) is sound and should be maintained. Our analysis indicates that the 26 degree angle is too restrictive from the point of view of property owners and, therefore, a zoning policy option of the 45ft.(13.7m)/38 degree type is an appropriate one to further this objective. This policy would enable economic redevelopment that enhances the attractiveness and retail health of the Mall. Particular attention, though, should be paid to certain sites fronting on Sparks Street which do not extend through to Queen Street and which, therefore, are most affected by such a zoning option.

Design Elements

We conclude that a height limit of 45 feet (13.7m) at the Mall is important in maintaining pedestrian scale, sunlight penetration and reducing negative wind effects from office towers. The retail character of the Sparks Street Mall should be maintained in redevelopment by requiring retail frontage on the Mall with separate access to individual retail facilities. Interior retail Malls should be discouraged in new developments.

Zoning controls tend to regulate development by establishing limits and constraints. Given the importance of the Mall and it's sensitive character we believe that developers should be permitted to submit imaginative proposals that may not meet the letter of the bylaw but may be more consistent with its spirit.

Some heritage related renovation or facade retention would add to the sense of the Mall as a pleasant pedestrian area. We conclude that there are financially viable opportunities for combined renovation/re-development projects. Moreover, for through block sites the combination of the location of heritage buildings (on Sparks Street) and the zoning policy structure (permitting higher densities on Queen Street) are complementary conditions. Therefore we believe that the City should encourage renovation where appropriate along the Sparks Street Mall.

Land Use

We conclude that the most appropriate primary uses for redevelopment in the study area are office and retail, with an emphasis on quality development. To support retail attractiveness and contribute to active use of the Mall, the City should encourage other additional restaurants and entertainment activities where possible. Parking for shoppers on the Mall is a significant problem. The City should investigate ways to encourage more parking to support retail activities on the Mall in the context of the Core Area's transportation needs.

SCOPE AND OBJECTIVES

The City of Ottawa is considering a change in the zoning bylaw for the two blocks on the south side of the Sparks Street Mall between Bank and Metcalfe Streets. The essence of the proposed bylaw is to impose a building height restriction of 45 feet at Sparks Street increasing to heights permitted by a 26 degree angle to Queen Street measured from the 45 foot height at Sparks Street. This form of development control was intended to protect the pedestrian environment by ensuring sunlight penetration to the Mall. Concern over the impact of this change on property values and retail trade was expressed by merchants and property owners in the area. Partly in response to these presentations, City Council decided that the environmental analysis should be supplemented by economic and financial analyses before a final decision on the bylaw was made.

The objectives of this study are to identify the potential impacts of alternative development controls which the City could consider, including the original bylaw, from the standpoint of:

- merchants
- property owners
- City of Ottawa
- Mall users

Analyses undertaken and described in this study included financial feasibility, fiscal impacts, retail trade, building design, and environmental analysis. To identify impacts, hypothetical developments were created for two land assembly options and three bylaw options; the proposed 45 ft./26 degree option, the previous C-2/8.0 option and a middle density option of 45 ft./38 degrees. The analysis was supplemented by a pedestrian survey which provided insights into the significance of the downtown employment population for retail trade.

The study is organized into 10 chapters. Chapters 1 and 2 set the area context, market conditions and the existing characteristics of the study blocks. Chapter 3 identifies

development constraints for the site. The development issues as perceived by the various interest groups and the City are described in Chapter 4, along with a summary of the possible roles for the Sparks Street Mall and adjacent development.

Chapters 5 and 6 describe the redevelopment options and the methodology for identifying impacts of each. Direct impacts including financial, fiscal, demographic and traffic impacts are discussed in Chapter 7. Possible changes in retail trade and environmental impacts are described in Chapters 8 and 9 respectively. Our conclusions and observations are set out in Chapter 10.

In addition to technical appendices which are referenced in the body of the report, metric conversions for all appropriate tables in the report are contained in Appendix F and the study terms of reference are contained in Appendix G.

1.0 AREA CONTEXT

1.1 Area Definition

This study is concerned with the development potential under different development controls of two blocks located on the south side of the Sparks Street Mall between Metcalfe and Bank Streets. The blocks are located in Ottawa's downtown, one block south of the Parliament Buildings, and form part of one of four major shopping streets in Ottawa's central area. (Exhibit 1.1).

The Sparks Street Mall, extending five blocks on an east/west axis between Elgin and Lyon Streets (Exhibit 1.2), is a significant feature in Ottawa's urban fabric and has earned a national and international reputation as a successful pedestrian shopping mall.

Jacques Greber first suggested the idea of a mall in the late 1950's. Shortly thereafter, Sparks Street businessmen, with the support of the Ottawa Board of Trade, began to promote the concept of a pedestrian mall in order to enhance the well-established shopping and financial attributes of Sparks Street. The City of Ottawa approved a temporary mall on Sparks Street in 1960 but not until 1967 was a permanent pedestrian mall, from Elgin to Bank Street, officially opened. Subsequently, the Mall has been extended westerly to Lyon Street in connection with Federal Government and private redevelopment projects.

1.2 Area Characteristics

Ottawa's downtown or "central area" has historically been the centre of business, finance, and shopping for residents of the Ottawa region. Although financial activities still locate in the central area, its role as a shopping area has declined, largely due to the growth of the suburbs and the related construction of shopping centres to serve them. Shopping remains as an important function of the central area, however, and efforts are now underway, primarily through the Rideau Centre Project, to

EXHIBIT 1.1: OTTAWA CENTRAL AREA - MAJOR SHOPPING STREETS

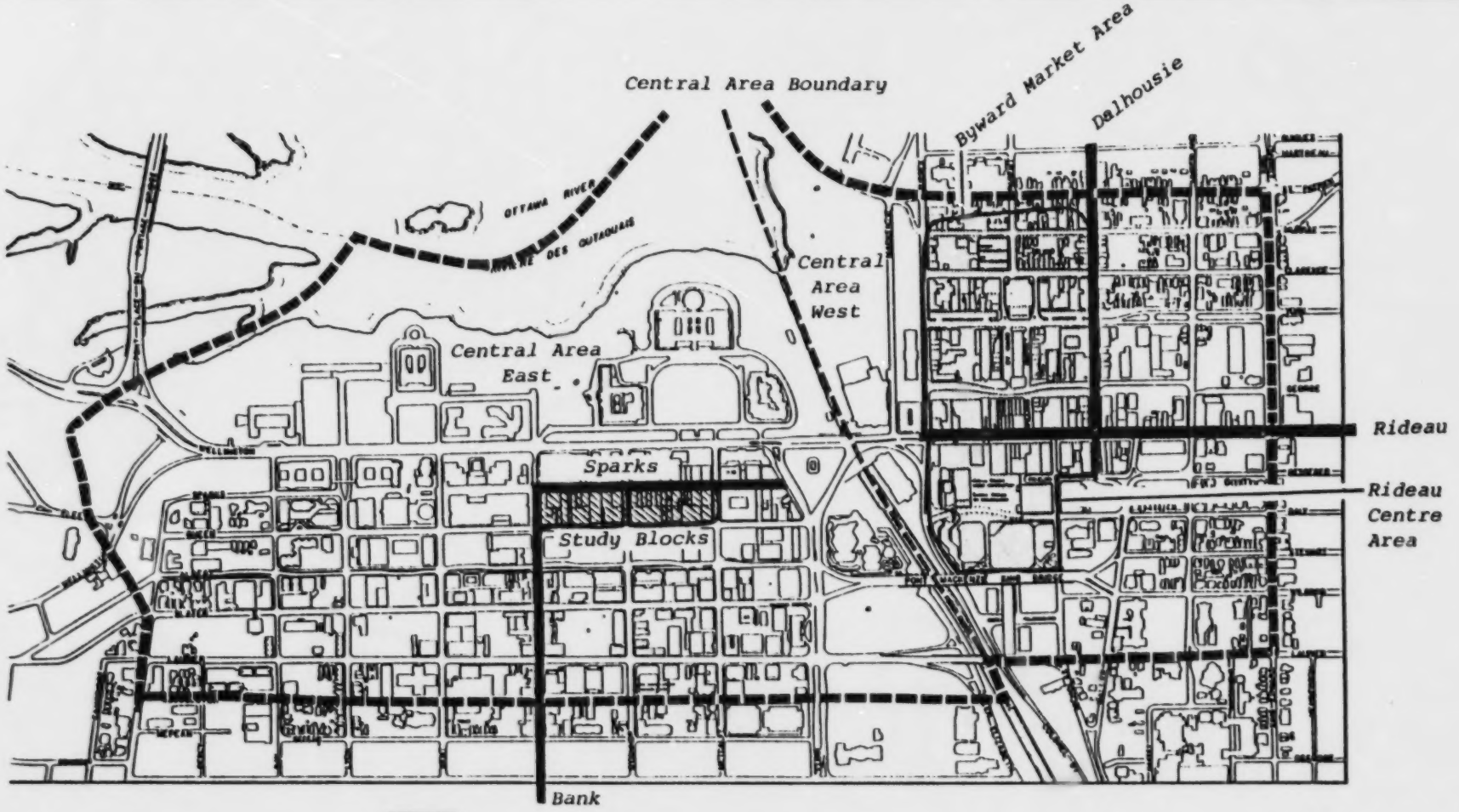
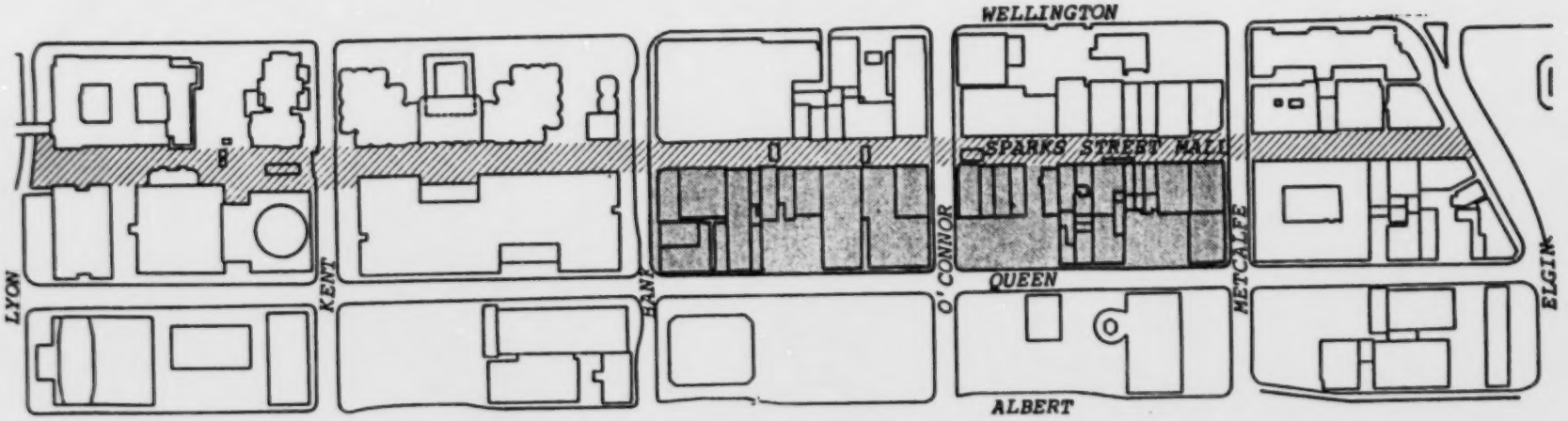


EXHIBIT 1.2: SPARKS STREET MALL



Study Blocks

revitalize the downtown's shopping attractiveness.

Activities within the central area are generally well delineated. Private sector and government offices are generally located west of the Rideau Canal (hereafter called central area west) with major shopping facilities and the Byward Market east of the Canal. Residential uses are located in both the eastern and western portions of the central area.

Just one block south of the Parliament Buildings, Sparks Street enjoys a unique location in the City. In addition to landmarks such as the Parliament Buildings to the north and Confederation Square to the east, Sparks Street is close to the National Arts Centre, the Government Conference Centre, major government facilities such as the Bank of Canada, the Supreme Court, and major hotels. It connects on the west to Bank Street, itself a major shopping street which has recently undergone substantial upgrading through private and public sector investment. Sparks Street has been known traditionally as the financial or business heart of the city with its financial institutions, insurance firms, law offices, and major Post Office.

With a total of nearly 20 million square feet (Exhibit 1.3) office uses dominate the distribution of central area land uses. The 2.8 million square feet of retail space represents about 17.7% of the Ottawa-Hull area retail facilities. As such, the central area is a significant regional shopping area. Central area west includes the majority of hotel and residential units as well as parking spaces.

EXHIBIT 1.3: OTTAWA CENTRAL AREA LAND USE - 1981

USE	CENTRAL AREA EAST	WEST	TOTAL
Office (millions sq. ft.)	2.54	17.19	19.73
Retail (millions sq. ft.)			
- DSTM	0.98	0.79	1.77
- Non DSTM	0.47	0.50	0.97
- Vacant Space	0.11	0.08	0.19
	1.56	1.27	2.83
Hotel (Units)	922	2,227	3,149
Residential (Units)	1,301	1,693	2,994
Parking (Spaces, all types)	5,575	13,229	18,804

Source: Compiled from Central Area Data Bank, City of Ottawa, 1982.

Residential land use is not dominant in the central area. Although the City has taken steps to encourage lower density residential uses at the fringe of the central area, market conditions and development limitations have combined to mitigate against significant additional residential development. For example, Centretown population decreased from 24,000 people in 1971 to 21,000 in 1976. The Central Area's population for the same period declined from 5,250 to 3,325, although it grew to 4,420 by 1981. Substantial lower-density rezoning of residential areas adjacent to the central area has been approved by the City, and is intended to encourage grade-related units and family-type accommodation.

The total employment in the Ottawa central area is estimated to be 62,875 jobs, the majority of which are located in the central area west (Exhibit 1.4). These jobs amount to approximately 24% of total employment in the Ottawa/Carleton region.

EXHIBIT 1.4: OTTAWA CENTRAL AREA EMPLOYMENT - 1981 (1)

EMPLOYMENT CATEGORY	CENTRAL AREA EAST	CENTRAL AREA WEST	CENTRAL AREA TOTAL	REGION
Office	6,716	45,702	52,418	189,631
Retail	4,268	3,628	7,896	35,643 (2)
Other	1,082	1,479	2,561	40,845
Total	12,066	50,809	62,875	266,119

Note: (1) Includes full and part-time employees.
(2) Includes wholesale.

Sources: City of Ottawa, Updates of Central Area Data Bank, 1982;

RMOC, Employment in Ottawa-Carleton 1976-81, (estimated by category by DPA Consulting Limited).

1.3 Development Trends

As indicated previously, the Ottawa central area presently includes about 20 million square feet of office space and 2.8 million square feet of retail space. Over the 10 years there has been about 90,000 square feet of retail growth. Office growth since 1970 has averaged about 600,000 square feet per year (Exhibit 1.5). The growth, however, has been sporadic, largely because of the Federal Government's policy of decentralizing office space to achieve a 75/25 office space split between Ottawa and Hull. At the present time, this policy objective is very close to being met and it is anticipated that future office development for government space will be balanced more evenly between Ottawa and Hull.

EXHIBIT 1.5: CENTRAL AREA WEST-POST 1970 DEVELOPMENTS

YEAR	GROSS FLOOR SPACE (office/retail) (sq.ft.)
1970	490,770
1971	1,774,670
1972	—
1973	166,524
1974	474,950
1975	1,668,942
1976	174,998
1977	1,622,689
1978	—
1979	—
1980	488,922
TOTAL	6,862,455
ANNUAL AVERAGE	686,246

Source: Compiled from various City of Ottawa sources.

Central area retail space has had a significantly lower rate of growth than has office space. Downtown retail business has suffered from the effects of five major influences:

a. suburban shopping centres which attract large portions of the resident population in the region;

b. the decentralization of Government office workers, mostly to Hull;

c. scattered retail locations with no sense of a core area focus of retail activity;

d. layout relative to pedestrian circulation; and

e. too many similiar retail facilities in dispersed locations throughout the core.

Both office and retail space is likely to increase significantly in the next 3 to 4 years. Office projects, either under construction or proposed, are expected to add some 2.5 million square feet of space, mostly in the central area west. About 1.2 million square feet of retail space will be added to the central

area if all proposed projects are constructed (Exhibits 1.6 and 1.7).

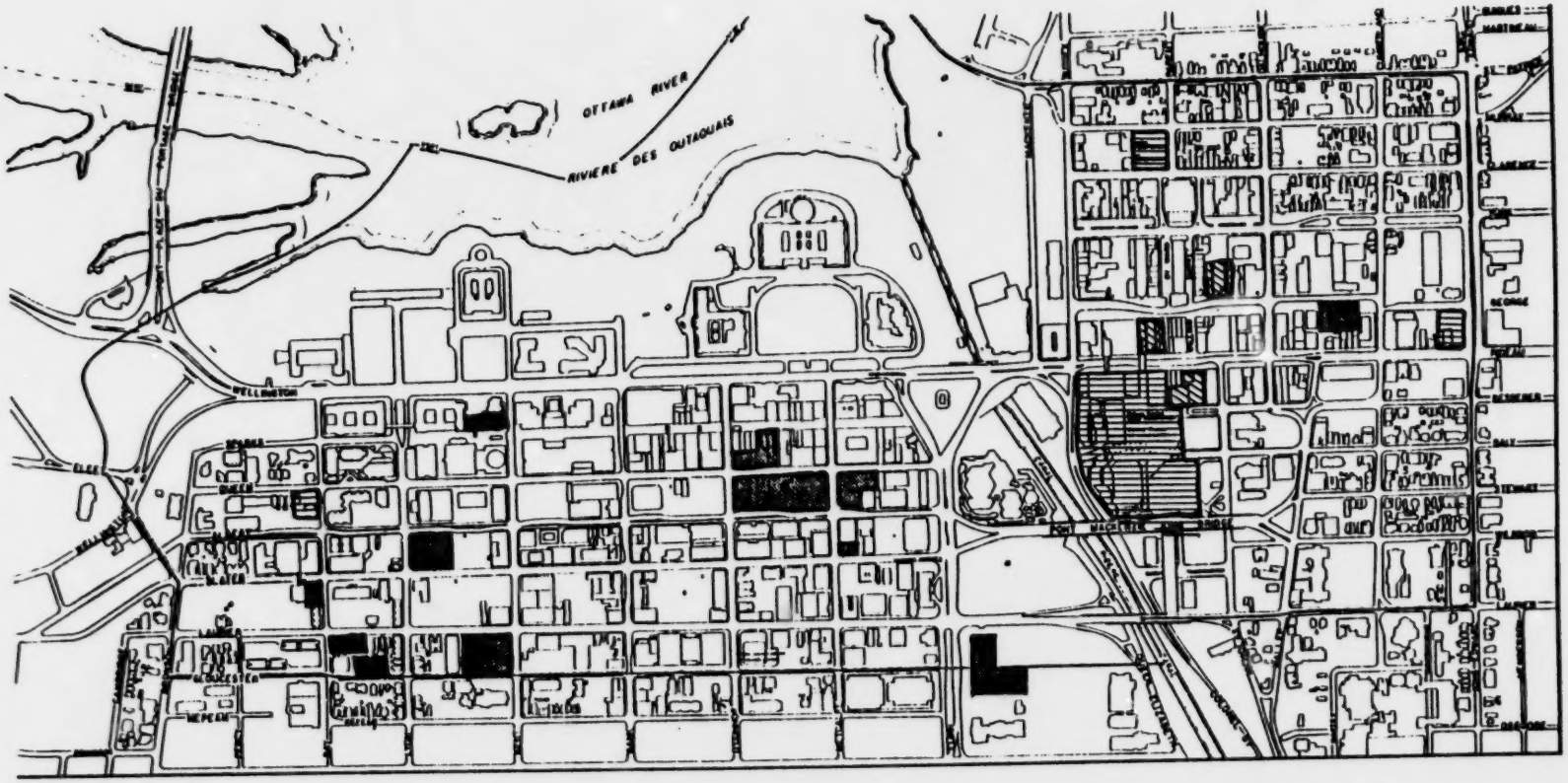
EXHIBIT 1.6: CENTRAL AREA PROPOSED DEVELOPMENT PROJECTS (1)

	OFFICE (million sq.ft)	RETAIL (million sq.ft.)	HOTEL/APT. (units)	PARKING (spaces)
Existing 1982				
East	2.54	1.52	2223	5601
West	17.19	1.19	3922	13269
Sub-Total	20.73	2.71	6,145	18,870
Cumulative Total	20.73	2.71	6,145	18,870
1983 Additions				
East	0.06	1.12	500	1568
West	0.74	0.05	236	659
Sub-total	0.80	1.17	736	1227
Cumulative Total	21.53	3.88	6,881	20,097
1984 Additions				
East	—	—	—	—
West	0.80	0.04	—	516
Sub-Total	0.80	0.04		516
Cumulative Total	22.33	3.92	6,881	20,613
Post '84 Additions				
East	0.75	0.02	340	271
West	0.19	0.02	386	169
Sub-Total	0.94	0.04	726	430
Cumulative Total	23.27	3.96	7,507	21,043

Note: (1) These estimates do not account for building demolitions or removal of parking areas.

Source: Compiled from City of Ottawa, Central Area, Current Projects, August, 1982.

EXHIBIT 1.7: CENTRAL AREA PROPOSED PROJECTS



Office (some retail may be included)

Residential

Retail

Mixed Use

Source: City of Ottawa, Current Projects: Central Area; 1982.

The Rideau Centre Project in central area east is the most significant mixed-use project in Ottawa's downtown. It will add 565,000 square feet of retail space and rationalize existing retail space on Rideau Street. In addition, the Rideau Centre will include a 500 unit hotel, a convention centre and, in Phase 2, a 750,000 square foot office complex.

Two proposed developments in central area west are likely to have a major impact on Sparks Street Mall. These are the Metropolitan Life Building on O'Connor Street, a 450,000 square foot office building on which construction recently commenced, and the Canlands Project, a Federal Government complex now at the concept planning stage, to be built mostly on the block bounded by Metcalfe, Albert, O'Connor and Queen but with associated development on Sparks Street. The Canlands Project preliminary building program includes 600,000 square feet of office space, a 600 car parking garage, a public outdoor park on Metcalfe Street, and retail and entertainment uses.

In addition to these proposed developments, the long-term future of the North side of Sparks Street between Bank and Metcalfe will affect the future of the Sparks Street Mall. This land is now owned by the Federal Government. It is expected that the retail frontage on the Mall's north side will be retained under an outstanding commitment on the part of the Federal Government to maintain the balance of retail and office space in these blocks. Future redevelopment possibilities include office space to house government support services and executive offices.

1.4 Study Block Relationship to Surrounding Area

Exhibit 1.8 illustrates the type and quantity of land use activity and employment levels at various distances from the study blocks. The location of these blocks is shown in Exhibit 1.9. There is a substantial employment population close to the Mall now with an even higher employment population likely in the next few years when proposed developments have been completed. At the present time there are approximately 47,000 people

employed within 3 to 4 blocks of Sparks Street Mall; this total is expected to increase to about 50,000 people when all currently planned projects have been completed. The potential increase is significantly higher if one includes the Rideau Centre project, expected tc ultimately employ over 2,000 people.

1.5 Area Polic'' Context

Applications for development in the central area must meet the test of the City's Zoning Bylaw and policies, and service-related regulations of the City and the Region. It is important to understand the context behind the bylaws, regulations, and policies in order to understand their intent.

1.5.1 Official Plans

The City's Official Plan, enacted in 1964, addressed only the general role of the central area. A more detailed plan for the central area (Amendment Number 62) was approved by the Province in 1972. Among other things, Amendment 62 set out a plan for land use, definitions of land use categories, and building height controls for the central area. The two study blocks were designated "central business area", a land use category that was, in the words of the Amendment,"...to be developed as a compact administrative, retail and commercial area to act as the main commercial centre within the City of Ottawa". Amendment 62 further prescribed a floor space index (FSI) limit of 8.0 for development on "central business area" lands and building height was limited in the two study blocks to 432 feet above sea level for the Bank/O'Connor Street block and 442 feet for the O'Connor/Metcalfe street block. The height limitations (permitting about 17-18 storey buildings) were to ensure that new development in the vicinity of the Parliament Buildings did not create the impression of crowding or of overpowering the Parliament Buildings and associated open spaces.

EXHIBIT 1.8: LAND USE AND EMPLOYMENT - DISTANCE FROM STUDY BLOCKS (1)

DISTANCE FROM STUDY BLOCKS	OFFICE (000's sq.ft.)			RETAIL (000's sq.ft.)			EMPLOYMENT (No. employees)			PARKING (Spaces)		
	EXISTING	PROPOSED	CUMULATIVE TOTAL	EXISTING	PROPOSED	CUMULATIVE TOTAL	EXISTING	(2) PROPOSED	CUMULATIVE TOTAL	EXISTING	PROPOSED	CUMULATIVE TOTAL
1. - 1 block	785	—	785	338	--	338	3,350	—	3,350	295	—	295
2. - 2 bl.	7622	516	8923	371	24	733	23083	1379	27812	3715	428	4438
3. - 3-4 bl.	5975	814	15712	364	84	1181	20510	2400	50722	5752	395	10585
4. - 4 + bl.	1263	377	17352	10	13	1204	2699	1044	54465	2345	270	13200

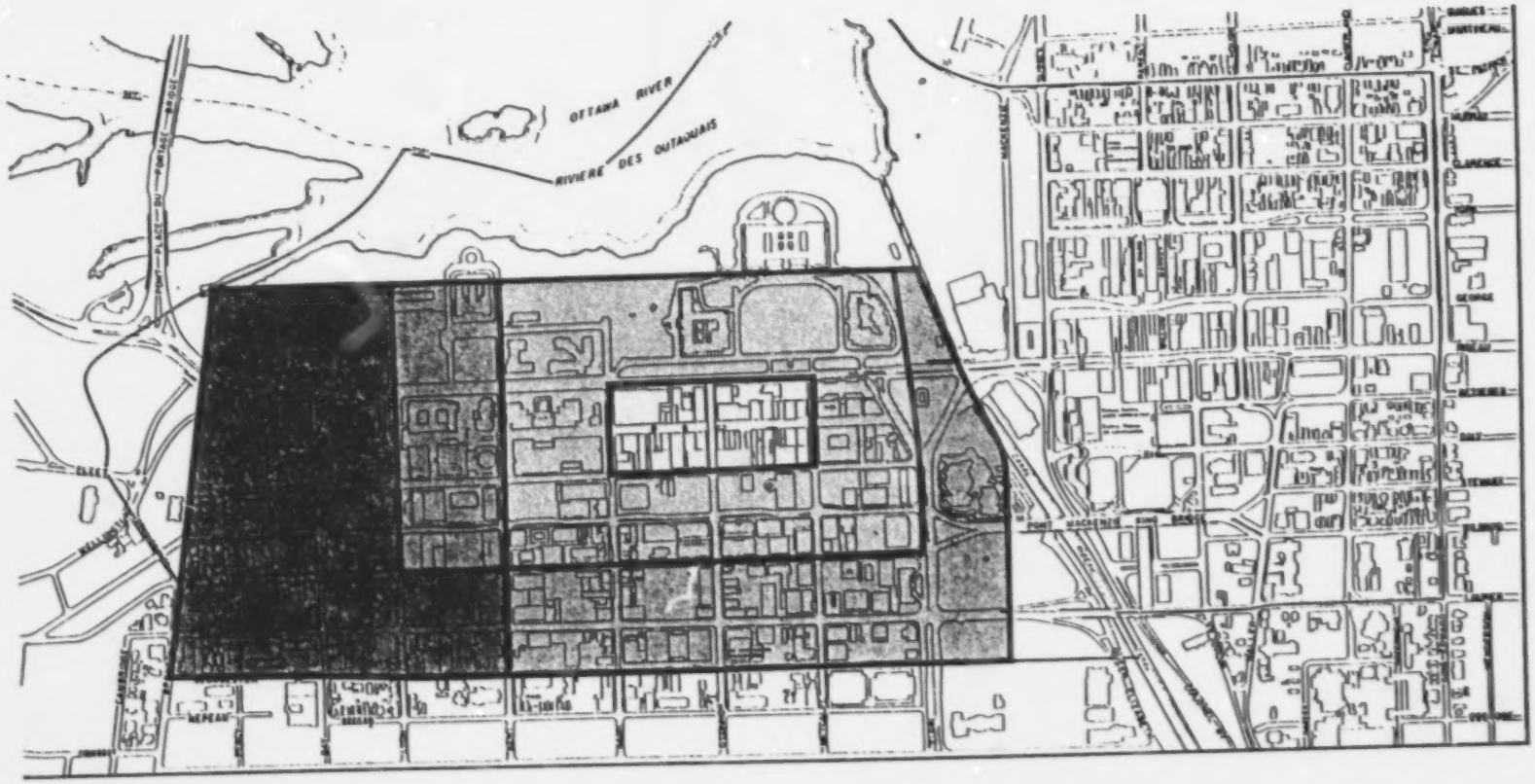
Notes: (1) These estimates do not account for building demolitions or removal of parking spaces.

(2) Employment in proposed buildings calculated by dividing total proposed space by current average space per central area employee (374 gross sq. feet per employee in 1981).

Sources: City of Ottawa, Central Area Data Bank, 1982;

City of Ottawa, Current Projects, Central Area, August 1982.

EXHIBIT 1.9: STUDY BLOCK DISTANCE GRIDS



The next major stage in the planning process was the adoption of the Regional Official Plan in 1974 by the Regional Municipality of Ottawa-Carleton. After analysis of alternative population distributions and their impacts on the transport network, an employment ceiling for the central area of about 100,000 jobs was approved. The Plan confirmed the thrust of the City's plan by stating that "the central area should be an important centre for shopping, the major location for government and business administration, the focus for entertainment and cultural pursuits, and be supported by stable residential districts on its periphery". A committment was made in the Plan to support growth in the central area without diminishing the level of service in transport, water and sewer systems provided by the Region. In addition, the Plan sets out a direction for encouraging "...high standards of urban design".

1.5.2 Central Area Planning Policies

Following the adoption of the City and Regional Plans, a major effort was undertaken by the City toward further refinement of policies for the central area. Ottawa City Council adopted a range of central area planning policies in 1979 which provide a context for development in the whole central area, including the two study blocks along Sparks Street. Highlights of the policies are described below.

The planning policies envisage a central area within which there would be a core area of high density office and retail uses. In fringe areas land use would be primarily residential. The overall policy for the core area is that it be:

- "....recognized as the most important commercial and cultural area within the Ottawa-Carleton region"

  and that

- "....positive action be taken on the part of the City to ensure that the core area is vibrant, economically

successful and, above all, enjoyable for people".

The City's planning policies confirmed the Regional Plan's transit emphasis with the following policy statement, that:

. "....the use of the private auto for day-time commuter work trips to the downtown core be discouraged, and that all other forms of transportation be encouraged".

Short term parking, however, was recognized by the City as a necessity for the proper functioning of the core area. A parking strategy developed in 1977, to encourage provision of short-term parking facilities, was reaffirmed in 1979 with the policy statement that:

. "...the City ensure the provision of attractively priced short-term parking to support the major downtown retailing area"

and that

. "...other levels of government be encouraged to do likewise".

In combination with these policies, a central area transportation network was proposed which stipulated that:

."....Sparks Street Mall remain in place,
Albert and Slater Streets act as major bus transit ways,
and, in the long-term,
Queen Street host a rapid-transit system".

The priority network element from the City's perspective is the Albert Street transitway.

Pedestrian circulation is recognized on two fronts:

. improvement of ground-level pedestrian environments (sidewalks, malls, and open spaces), and

- provision of an elevated pedestrian system to link buildings as they are redeveloped.

Linkages to the elevated pedestrian system will be required across Queen Street from buildings proposed for the south side of Queen to buildings on the two study blocks (Exhibit 1.10).

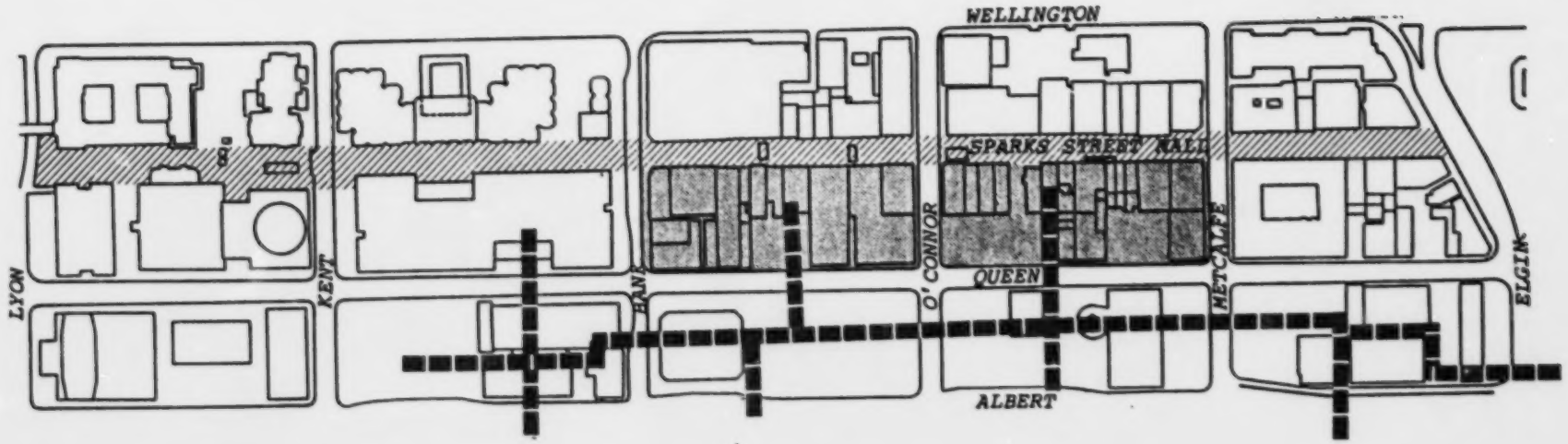
In summary, the City land use policies generally call for:

- controlling future employment levels (in order to be consistent with the Region Official Plan),
- limiting high density commercial development in the fringe areas and encouraging residential use in these areas,
- encouraging private office development in the core area, and
- strengthening the retail sector in the central area.

The City retail policies require that major retail facilities proposed outside the central area be assessed against their potential impact on central area facilities. The City strongly supports central area retailing and states that:

> "...every effort be made by the City to retain or strengthen the economic viability of the major traditional shopping streets in the core area, that is Bank Street (from Sparks to Gloucester), Sparks Street (from Bank to Elgin), and Rideau Street (from Sussex to Waller), recognizing that these perform different roles within the core area;" and that

EXHIBIT 1.10: ELEVATED PEDESTRIAN SYSTEM



Elevated Pedestrian System

Pedestrian Mall

Study Blocks

Source: City of Ottawa, Central Area; 1979.

> ."...the special characteristics of these major traditional shopping streets in the core area be identified and that the elements conducive to the successful functioning of each be encouraged by the City".

Heritage areas were identified in the planning policies as being important to protect where possible. The Sparks Street Mall from Bank to Elgin Street was designated as one such heritage area within which heritage buildings of value or potential value have been identified. These are described in more detail in Chapter 2.

1.5.3 Design Policies

In matters of urban design, the City sets out a policy direction to provide high quality indoor and outdoor urban space and encourage attention to sensitive building design and, in particular, to:

> "...micro-climatic conditions in all the pedestrian spaces in the downtown area".

Many of the policies for the central area have been translated into specific standards and incorporated into bylaws, official plans or simply adopted as City policy. These include policies affecting the elevated pedestrian system, sidewalks, and height restrictions (discussed in more detail in Chapter 3.0).

1.6 Market Context

The existing market context is important in attempting to understand potential financial impacts from proposed changes in zoning regulation. Interviews were conducted with the local development industry and with real estate firms which specialize in commercial real estate to identify present office and retail market conditions.

Office rentals in the downtown area vary in accordance with

general market conditions, the type of office building, the quality of office building and the location of that building in relation to what may be termed the core of the downtown. It has been determined that rent levels can vary anywhere from about $6.00/sq. ft. net for space in older office structures to about $23.00/sq. ft. net in the highest quality office accommodation in the downtown. At the present time rentals are depressed for office space, with prime space going for about $17 per sq. ft. net. This is likely to be a temporary situation, with prices increasing as demand strengthens.

Given the location of the study blocks as both desirable and close to the so called "centre" of the financial district, one can reasonably expect office rentals at the higher level provided that such office accommodation is in new buildings with the best of layouts, lobbys, elevators, and window areas. As was previously noted in this report, office absorption in the core area over the last ten years has averaged about 600,000 sq. ft. per year. Demand is expected to continue at about 500,000 to 600,000 sq. ft. per year although there will be imbalances in demand and/or supply depending upon the timing for new buildings and demands for new space by potential tenants, particularly government.

It is assumed for the purposes of this study that an average demand situation is available for office accommodation proposed in the hypothetical redevelopment. This assumption is made so as not to unnecessarily complicate the study and to enable a comparison of the relative merits of the zoning bylaw options. On other other hand, of course, consideration is given to the nature of the office space proposed in the hypothetical redevelopments given the market consensus through the pricing system about certain types of office space and office buildings. Moreover, an attempt will be made to differentiate office space by quality within hypothetical buildings which mirrors the leasing negotiation process experienced by building owners and prospective tenants and which results in differing per foot rentals depending upon the lease arrangements.

The retail market is a less predictable market in terms of the pricing system. In addition, there are various arrangements for retail space leases, including a standard rate per square foot, a combination of a base per square foot rate and a percentage of gross income, and some which are based strictly on a percentage of gross income. It would appear from discussions with various leasing agents and development industry representatives that a retail store located on the Mall should command leases at the higher end of the retail rates - at about $25.00/sq. ft. net. Rentals for other locations such as Queen Street would be significantly lower, at about $15.00 per sq. ft.

Estimates of present land values vary anywhere from $140 to $225 per square foot. The Provincial Assessment Department estimates that land values amount to about $200-225.00 dollars per sq. ft. on Sparks Street and about $170 per sq. ft. on Queen Street. With the current depression in office rentals, there has been a corresponding decrease in land values to about $150 per square foot in the study blocks. These figures, of course, vary depending on the willing buyer/willing seller principle. Certain properties can achieve higher land values if, for instance, they are the key parcels in land assemblies.

2.0 CHARACTERISTICS OF THE TWO STUDY BLOCKS

2.1 Land Characteristics

The study blocks are each approximately 2.4 acres in size (block dimensions are shown in Exhibit 2.1.). The blocks have a relatively restricted depth of approximately 200 feet and there is a gradual slope from Sparks Street to Queen Street varying from about 2 feet between Sparks and Queen Streets along the Bank Street edge, to about 10 feet between Sparks and Queen Streets along the Metcalfe edge of the blocks.

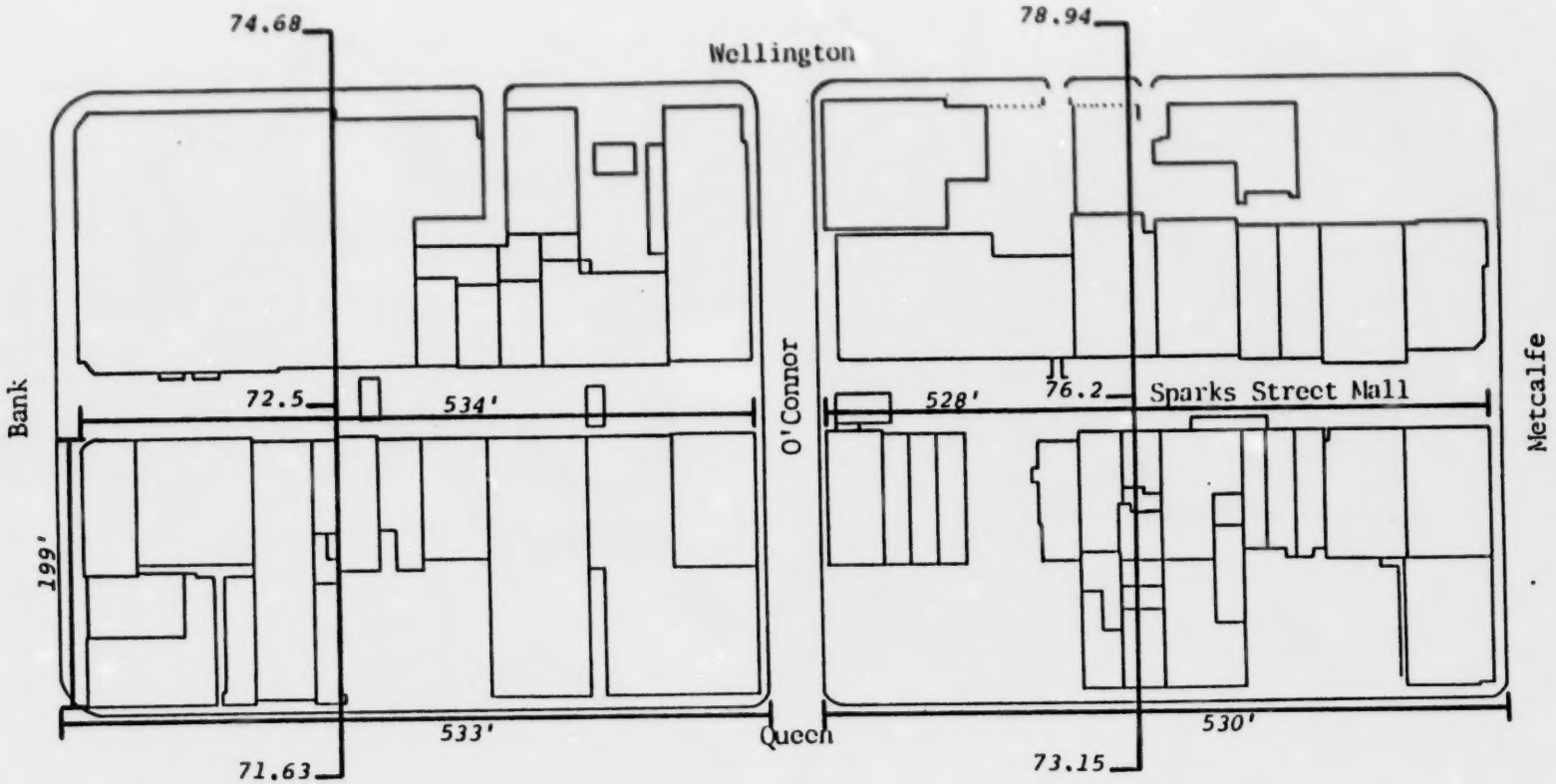
2.2 Building Characteristics

The study blocks each contain about 300,000 square feet of floor space. The predominant use is retail space, amounting to approximately 232,000 square feet. The buildings house 1230 employees (Exhibit 2.2) in both office and retail uses. Space in the Bank/O'Connor block is less efficiently used, given the higher figures of floor space per employee, and there is about twice as much vacant space in this block as there is in the O'Connor/Metcalfe block.

Generalized land use within the study blocks is shown in Exhibits 2.3 and 2.4, the latter indicating ground floor uses by civic number. The Sparks Street frontage is largely retail, with the major stores being Marks & Spencer, Woolworths and Zellers. Frontages on Bank and Queen Streets are occupied mainly by restaurant facilities and parking areas. Uses are further broken down by standard industrial classification (SIC) categories in Exhibit 2.5 which shows the total floor space for each of the SIC categories and average floor space for individual uses.

Older low-rise buildings dominate the built form. Four heritage buildings have been identified by the City. By popular name these are: the Yesterday's restaurant block, Zellers, the Trafalgar Building and the Sovereign Building, the locations of which are shown in Exhibit 2.6.

EXHIBIT 2.1: BLOCK DIMENSIONS



Source: City of Ottawa

EXHIBIT 2.2: STUDY BLOCK CHARACTERISTICS, 1981

CHARACTERISTICS	BANK/O'CONNOR (sq. ft.)	O'CONNOR/METCALFE (sq. ft.)
Floor space	301,900 (gross)	305,400 (gross)
Retail space	118,700	113,300
Office Space	50,000	110,300
Vacant Space	46,400	22,000
FSI	2.8	2.9
Employment (1)		
Retail	322	353
Office	153	401
Space (Sq.Ft.) Per Employee (2)		
Retail	369	321
Office	327	275

Notes: (1) Includes full and part-time employees
(2) Excludes vacant space

Source: City of Ottawa, Central Area Data Bank, 1982

EXHIBIT 2.3: GENERALIZED LAND USE (FOR STUDY BLOCKS)

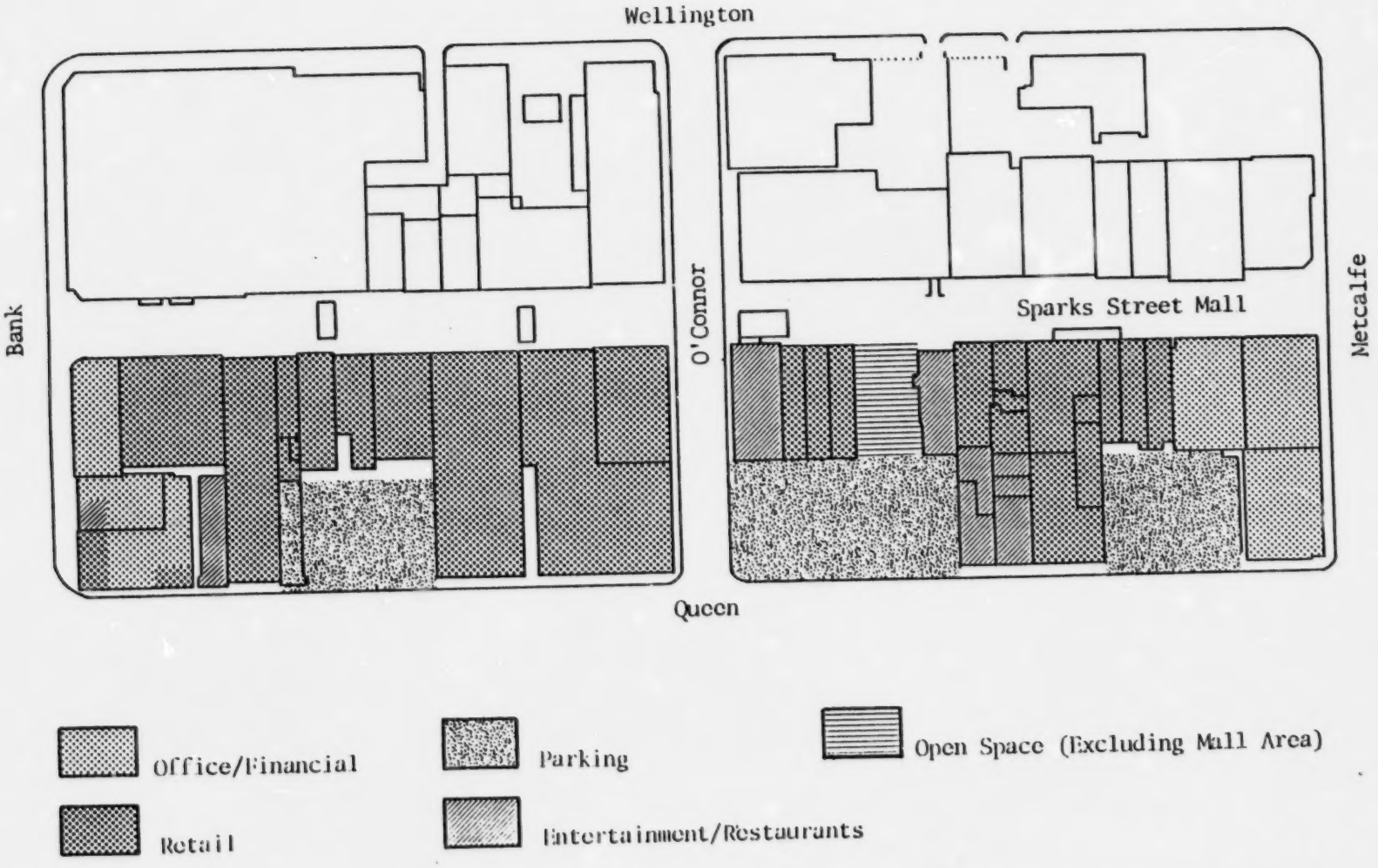


EXHIBIT 2.4: EXISTING GROUND FLOOR USES

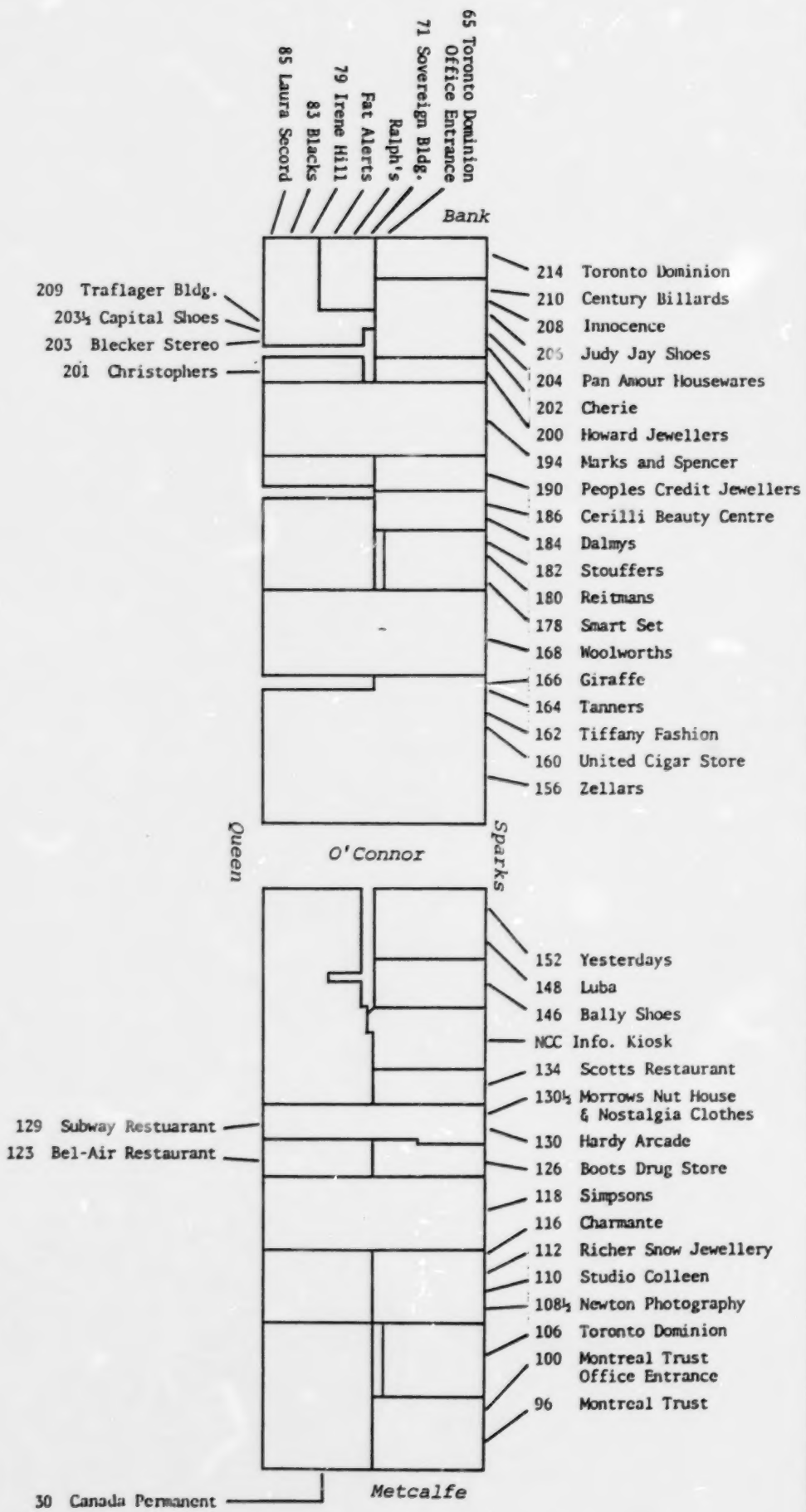
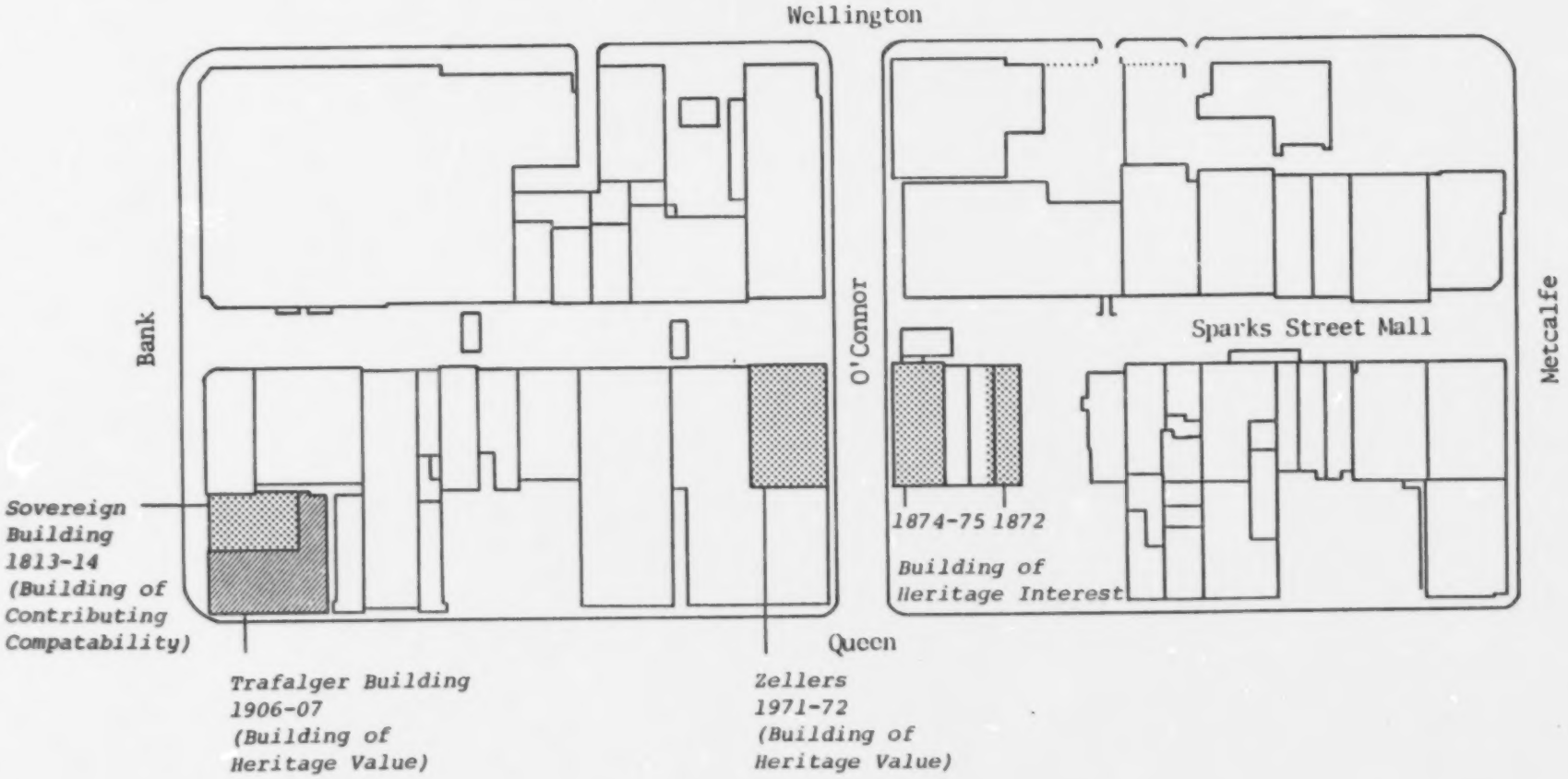


EXHIBIT 2.5 - SPARKS STREET FRONTAGE CHARACTERISTICS

S.I.C. Category	Number of Tenants	Total Floor Space	Average Floor Space/ Tenant	Number of Employees
BANK/O'CONNOR BLOCK				
vacant space	2 vacant spaces	33,696	16,848	—
general merchandise	3	63,392	21,131	108
retail (clothing/shoes)	12	24,348	2,029	61
jewellry, tobacco, retail not classified elsewhere)	6	18,470	3,078	25
banks and brokerage	1	3,456	—	15
amusement/recreation services	1	12,550	—	3
business services	3	4,130	1,377	17
personal services	2	6,118	3,059	6
non-Canadian incorporated companies	1	7,000	—	—
O'CONNOR/METCALFE BLOCK				
vacant space	2 vacant spaces	9,800	4,900	—
general merchandise	1	61,300	—	159
retail (clothing/shoes)	1	3,210	—	4
jewellry, tobacco, retail not classified elsewhere	3	5,689	1,896	12
banks and brokerage	5	28,916	5,783	100
medical	1	385	—	1
business services	16	33,644	2,103	138
personal services	1	2,200	—	4

STANDARD INDUSTRIAL CLASSIFICATION CODES (1970)

EXHIBIT 2.6: HERITAGE BUILDINGS / AREAS (PROPOSED)

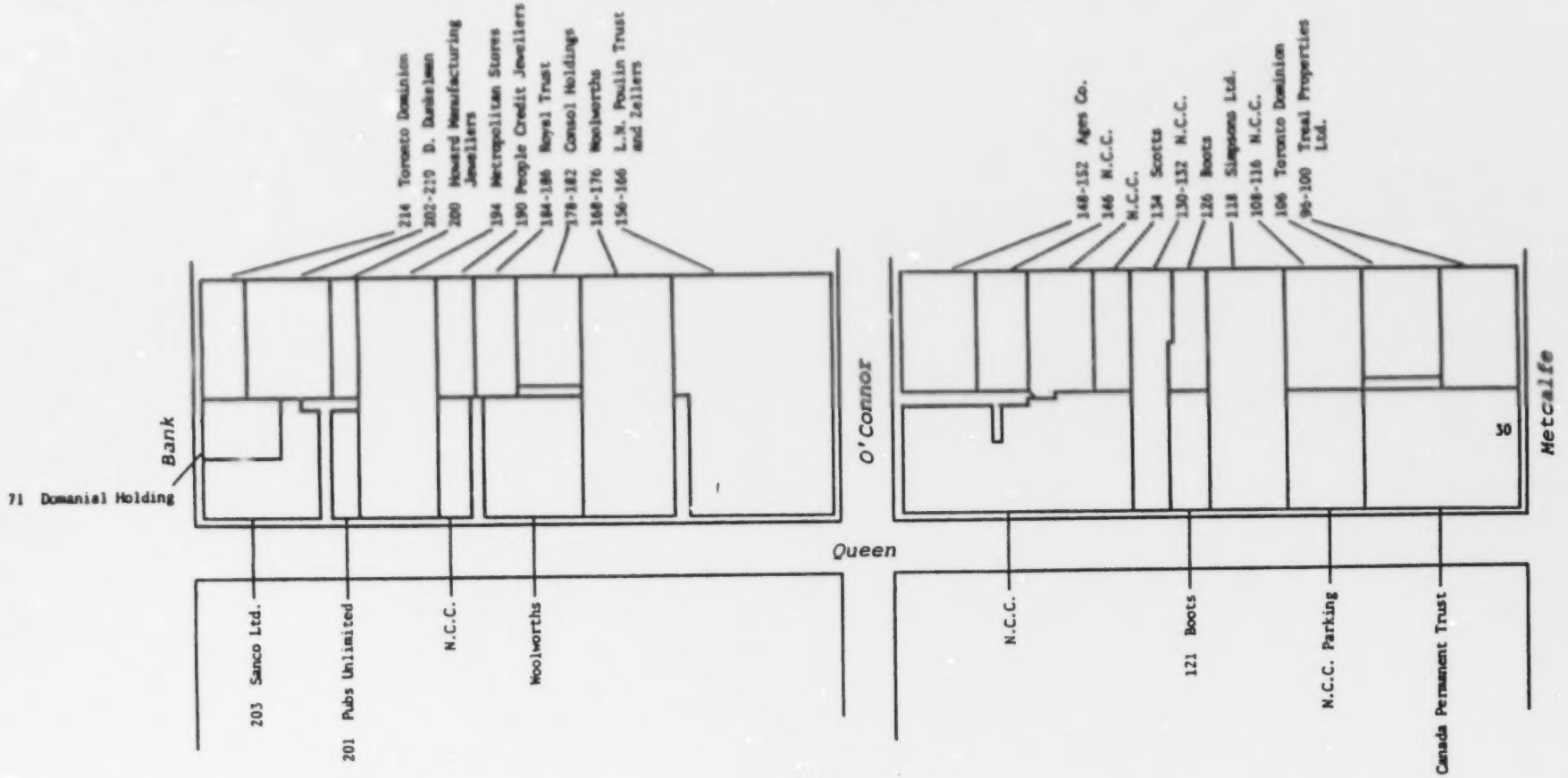


Source: City of Ottawa, Sparks Street Environmental Study

2.3 Land Ownership Pattern

Land ownership, illustrated in Exhibit 2.7, is fragmented, with no major assemblies dominating the Bank/O'Connor block. The Federal Government (NCC), with a number of properties in the O'Connor/Metcalfe block, is the major landowner. The west block, however, is in private hands with the exception of one small NCC property fronting on Queen Street. Properties are of various sizes and frontages. There are several mid-block rights-of-way, but no utility easements which would have to be taken into account in redevelopment proposals.

EXHIBIT 2.7: LAND OWNERSHIP



Source: City of Ottawa, Central Area Data Bank and Assessment Records.

3.0 SITE CONSTRAINTS

Constraints on redevelopment have been examined in each of three areas; infrastructure supply, zoning requirements, and design elements relating to the policy context. These are discussed in turn below.

3.1 Infrastructure Supply

Sewer and water capacities are available to accommodate any development up to and including the most intensive development option, that is, a Floor Space Index (FSI) of 8.0. The sewerage system on both Sparks and Queen Street is separated for storm and sanitary sewers and is relatively new, having been constructed in the 1960's. According to the City there are no constraints for redevelopment attributable to either of these services.

Bank, O'Connor, Metcalfe and Queen Street are all regional roads under the jurisdiction of the Regional Municipality of Ottawa-Carleton. Long-term plans for these streets are as follows:

- Metcalfe and O'Connor Streets - a possible widening of the sidewalks and restriction of traffic flow to two lanes;

- Bank Street - may be considered for a future transit mall north of Queen Street; and

- Queen Street - continue to function as a major arterial in the downtown core and become more heavily used by cars after the Albert Street transit-way has been implemented.

To provide for a long-term objective of 66 foot rights-of-way, the Region requires an additional three foot strip of land if redevelopment occurs on any of the regional streets. This land is to be transferred to the Region at no cost. Thus, for each of the study blocks, the land area available for redevelopment will

be reduced by a 3 foot strip parallel to the present property lines along all of the regional-road frontages.

Access and egress is a somewhat more flexible consideration for re-development, although the final decision on location of curbs rests with the Region. Depending on the nature of re-development, and its location on each of the two blocks, the Region has suggested that access to any underground parking facilities be located opposite access to new development on the south side of Queen Street. For the Bank/O'Connor block, this would be opposite the access point to the Metropolitan Life building now under construction. Similarly, for the O'Connor/Metcalfe block access would be encouraged to line up on Queen Street with an access point to the Canlands property on the south side of Queen Street. For service access, the Region discourages service arrangements where vehicles would have to back out onto the street. Here again, though, they take a flexible approach, depending on building size and building configuration. It may be that service access could be provided via Metcalfe or O'Connor Street respectively, depending on the size of buildings. For small site redevelopment, the Region is prepared to permit "backout" service facilities.

3.2 Zoning Requirements

The study blocks are presently zoned C-2X, a form of holding bylaw where a City Council decision is required for major developments. The previous bylaw, and the one which the City is proposing to change, included two primary zoning requirements; a height restriction and a floor space index restriction. The height restrictions were 432 feet and 442 feet above sea level for the Bank/O'Connor and O'Connor/Metcalfe blocks respectively, permitting buildings of about 15-16 stories. In addition, the definition of "Basement" in the zoning bylaw, that is... a portion of a building having less than 1/2 its floor to ceiling height below grade", allows for further minor flexibility in the number of floors which would be constructed under the height

restriction.

The maximum floor space index permitted on the 2 study blocks is 8.0. The zoning bylaw definition of FSI is the ratio of the gross floor area of building to the gross area of the lot including a 3 ft. road allowance dedication in which the building or buildings is located. Gross floor area in this definition is calculated by adding the area contained within the exterior walls of each floor level but excluding the floors occupied by physical plant equipment (heating, ventilation, etc).

A range of commercial uses, including office, retail and entertainment uses, are permitted and buildings are not required to have setbacks or parking.

3.3 Policy Context Design Constraints

There are three design constraints which affect redevelopment. These are based on the pedestrian policies of the City and/or Region. The first of these is that an elevated pedestrian system for major redevelopment is required to link development south of Queen to development on either of the study blocks. Each block is to have one linkage, located approximately mid-block, and entering the building at the second story level.

The City and Region have jointly adopted a sidewalk design policy which requires (in addition to the road allowance of 3 feet on regional-roads, mentioned above), a sidewalk easement of 5 feet to be provided by a setback of the first floor level of the building from the new property line. This may be done either through a cantilever option, where the building extends over the five-foot sidewalk easement, or a colonnade option, where pillars are permitted to extend downward from the second floor to the edge of the new property line. In the case of the colonnade option, 8 feet of sidewalk easement must be provided in addition to the width of the columns.

The final design constraint relates to wind effects which may be created by major new buildings. While there are no specific design guidelines, the City's present policy is to require a wind-tunnel test for major buildings (although no definition of major building is given) in order to determine whether wind effects would be acceptable at the sidewalk level.

4.0 DEVELOPMENT POTENTIAL

4.1 Introduction

The basic issue in this study is the degree to which a change in zoning bylaw regulations will affect 1) property values, 2) development potential, and 3) retail trade on the Sparks Street Mall. This is a complex question. There are various public, non-profit, and private interests involved, each of which have various perspectives on the future development of the south side of Sparks Street Mall.

4.2 Development Issues

The City's motivation in considering a zoning change for the study blocks reflects a desire to ensure that the Mall remains a pleasant pedestrian environment after redevelopment. The proposed zoning regulations recommended a height limit of 45 feet established at the southern property line of the Mall between Bank and Metcalfe Streets with development south to be restricted to a 26 degree envelope which extends towards Queen Street from the 45 foot height limit.

The combination of the height control and building envelope would ensure substantial penetration of sunlight to the Mall itself, interrupted only by major buildings outside of the two block area (for instance, The Royal Bank, MetLife, and 240 Sparks) depending on the time of year and the time of day. The principle behind the proposed zoning bylaw is that the availability of sunlight is critically important in maintaining the attractiveness of the Mall as a pedestian and shopping area. An additional implication of this proposed bylaw is reduced wind problems through lower building heights. Underlying these principles is the view that the public benefit of such a set of zoning regulations outweighs the private costs associated with a change in zoning.

A zoning bylaw essentially defines public rights to private property; in this case, construction of certain types of

buildings. The City's proposed bylaw is based on the contention that under the present bylaw, if redevelopment were to occur, the resulting structures could seriously alter the environment of the mall and, therefore, retail trade. There are in fact several stakeholders involved who would be affected by bylaw changes: property owners, retailers, the municipal fiscal position and the public good. Exhibit 4.1 illustrates how development intensity may effect each of these.

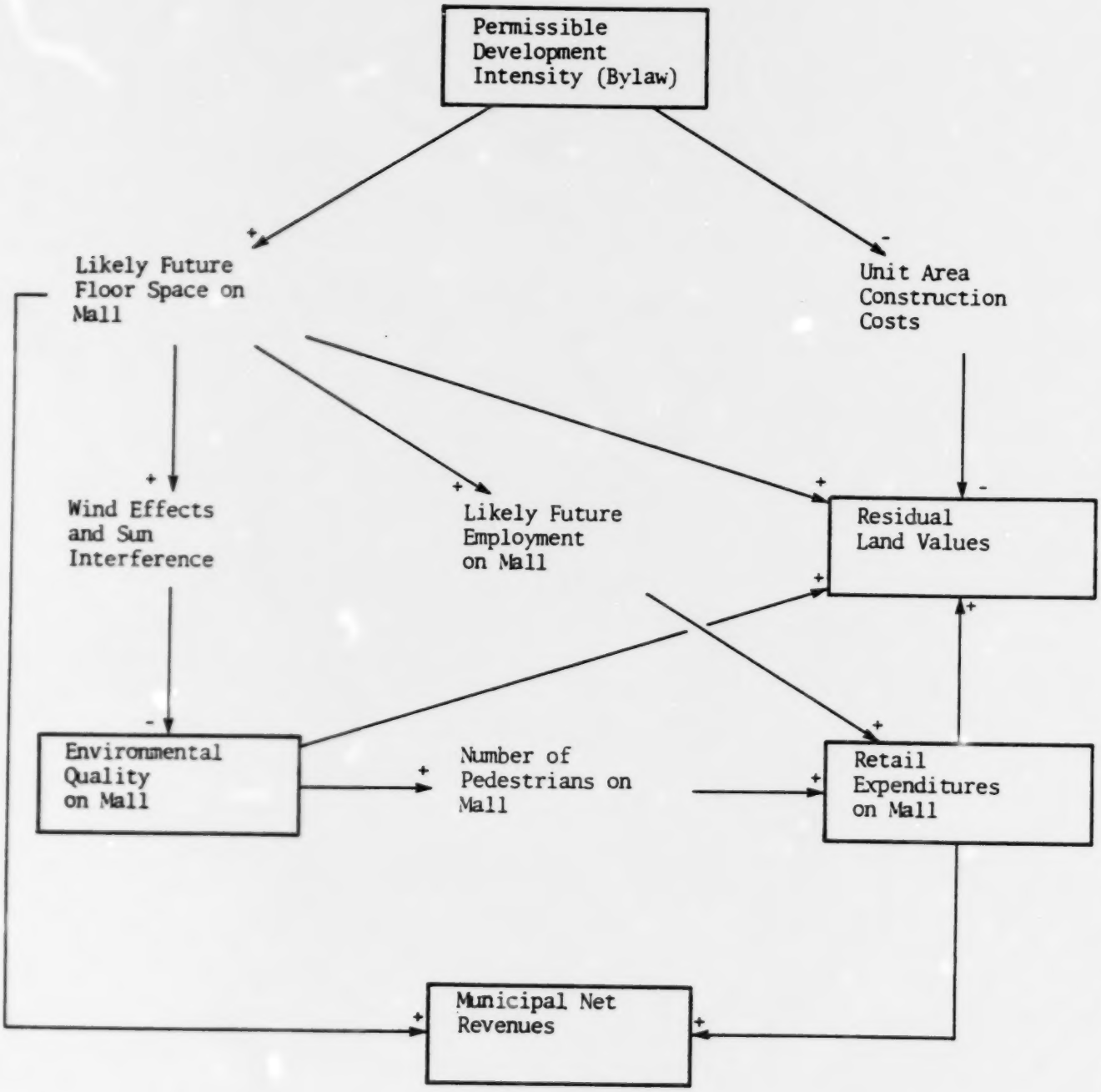
Environmental quality has a direct relationship with permissible intensity of development. As floor space increases, wind effects and sun interference would generally increase resulting in environmental degradation.

Retail expenditures are a positive function of future floor space (resulting in higher employment population) and number of pedestrians on the Mall. This relationship is somewhat complicated by the positive relationship between environmental quality and the number of pedestrians and the negative relationship between floor space and environmental quality.

Impacts of permissible development intensity on residual land values and municipal net revenues are most complex, with each related to environmental quality, future floor space and retail expenditures. In addition, residual land values are affected by the construction costs associated with different development intensities.

Thus, there are several interests and perspectives involved. Some opinions on impacts are put forward in the report submitted to the City by the Sparks Street environmental study committee, a voluntary committee of interested merchants, property owners, development industry representatives, and citizen interest groups. In order to ascertain the range of perspectives which exists, and to determine if all issues are being considered, interviews were conducted with individual members of this committee. A summary of various viewpoints is presented in

EXHIBIT 4.1: HOW DEVELOPMENT INTENSITY AFFECTS KEY INDICATORS OF STAKEHOLDERS (PUBLIC GOOD, RETAILERS, PROPERTY OWNERS, MUNICIPAL, FISCAL)


Permissible Development Intensity (Bylaw)
Likely Future Floor Space on Mall
Unit Area Construction Costs
Wind Effects and Sun Interference
Likely Future Employment on Mall
Residual Land Values
Environmental Quality on Mall
Number of Pedestrians on Mall
Retail Expenditures on Mall
Municipal Net Revenues

Note: Development Intensity and Key Indicators are Highlighted in Boxes

Exhibit 4.2. No summary can do justice to the range of opinions expressed, but some of the major points are outlined below.

1. Redevelopment should be economic, well designed and high density, but not necessarily to a floor space index of 8.0. The 45 foot height limit on Sparks Street does not allow for financially viable buildings.

2. The sun should not be the sole guideline in deciding on zoning regulations. The sun should penetrate to the Mall but it is not important at mid-winter.

3. Renovation is fine though expensive and should only be undertaken where it is financially viable.

4. Uses should include retail and office in any redevelopment. It is important that there be access to retail space at ground level from the Mall itself. The frontage treatment on the Mall is important and indoor retail spaces served by an interior mall should be discouraged.

5. There should be a variety of building heights and good and imaginative design is essential. Redevelopment should be of high quality and aesthetically pleasing.

6. Other issues which were identified include a lack of parking to serve the retail activity; potential wind problems from redevelopment; a perception that the Mall is not maintained properly; a perception that the Mall retail quality is deteriorating; and, that there is not enough night-time activity on the Mall.

One of the themes which runs through many of the comments made by members of the Sparks Street environmental study committee is that of the identity and role of the Mall itself. There was some

EXHIBIT 4.2: SPARKS STREET COMMITTEE - ISSUES COMMENTARY

Interviews	Bulk and Height	Sun	"Heritage"
1.	Dense Devt. F.S.I. 8.0 +	Not too important - a non-issue	If preservation wanted, then expropriate at market prices
2.	45 feet limit too restrictive	Not too important	Heritage bldg. designation questionable/uneconomic
3.	Height not so important if designed properly	Not important	"Heritage notion a poor concept/ bldg quality and neighbourhood preservation important
4.	FSI of 8.0 or 4.0 is not the issue/ Issue is positive redevelopment	Mid-winter sun of no importance	No comment
5.	Don't need high-rise but do need econodic development	Importance of sunlight in mid-winter "crazy"	Restoration where possible but this to be feasible economically
6.	Don't want a whole lot of high buildings	Sun important in Summer, Spring, Fall but not so much in Winter	Would like general variety and mix to remain
7.	F.S.I. 6.0 as minimum/ prefer Podia with towers/ 45 ft. limit doesn't encourage developers	Not the major criterion	Preservation expensive; structures often too old Must be economic to refurbish
8.	45 foot limit would not allow for redevelopment/ Need high density, good design	Not important, particularly in mid-winter	Buildings in question do not seem to be worth preserving/
9.	Some low-rise adds variety/ On balance against redevelopment	Sun shouldn't be sole guideline	Some quality renovation would be an asset
10.	Aesthetically pleasing redevelopment that is financially viable is a must/ 45 foot height limit too restrictive	Choice of sun criterion in December very questionable	No comment
11.	45 feet too restrictive/ Lots of room for compromise within N.C.C. heights	Sun important but other factors must be considered such as viability/ December criterion questionable	No comment
12.	Human scale and good pedestrian environment is critical/ May be achieved by compromise but no guarantees without controls	Sun important for pedestrian environment/ Height limitation also important to reduce wind effects	Heritage buildings should be maintained to enhance variety, human scale and pedestrian interests
Summary	Require high density economic and well designed redevelopment	Sun should penetrate to Mall but not so important at mid-winter	Renovated where financially viable

EXHIBIT 4.2 (Cont'd.)

Interviews	Role & Uses	Opinions on Royal Bank Bldg.	Preferred Development Approach/Concept	Other Comments
1.	Retail & Commercial office	Frontage treatment unsuitable/ Need more direct access to Mall.	Various heights but dense development/ Cover the Mall/ .Co-operation among City, NCC & DPW	.Mall must be lively and economically viable to compete with suburban shopping centres
2.	Lively and Viable retail & office; maybe residential	Doesn't encourage interaction with Mall	Mix of uses in well designed redevelopment/ Arbitrary height restrictions limit imaginative treatment/ Open-up Mall along sides	.Sparks St. may be already in decline/ 45 ft. limit will be "death knell" of improvement/FSI of 8.0 may be unnecessary but redevelopment must be financially worthwhile
3.	Redevelopment, retail & office	No Comment	Consider whole area: Wellington, Elgin Albert, Bank/ Must work with NCC & DPW	.Proposed 45 ft. and 26 degree angle make redevelopment uneconomic/ Problems of impact on Queen Street
4.	Primary function is retail, not open space	No Comment	.Must maintain human scale at sidewalk/ various heights/ open throughways off the Mall/ Need sunny places - not continuous sun .various heights	Must maintain quality of Mall in order to attract people/ .45 ft. will effectively stop redevelopment/ .Need to promote developer interest at reasonable FSI to ensure imaginative redevelopment
5.	Retail & office	Layout poor/ Spectacular bldg. but isolated from Mall by glass wall	.Good design vital to avoid "concrete canyon"/ .Variety of height & type of bldgs./ Redevelopment must be economic	.Mall deteriorating/ .Bankruptcies along Mall increasing/ .Must maintain/improve quality or stores will drop in value/ .Parking a problem
6.	Retail - boutiques at street level	Too glassy/ Doesn't suit Mall atmosphere	.prefer variety and low profile 4 to 6 storey - individual store fronts/ .prefer stone to glass/ .offices nearby but not directly above shops	.Don't want downtown Ottawa to be like Toronto/ .Mall should be active place/ .Parking space critical/ .Wind could be a problem with high buildings
7.	Ground floors retail mix of office and residential above	Reflective glass at street level not good	.4 storey at Mall but set back to towers penetrating 26 degree line .NCC & DPW must be brought in/ .Design flexibility/ .Need land assembly	.Wind problem should be minimized/ .Decline in store quality apparent/ .Need mix of uses to prevent "death" of Mall at night/ .24U Sparks/B. of Canada - sheer walls to be avoided
8.	Quality retail and office/ some residential brought back to the core near Sparks Street	Excellent building but Sparks frontage treatment not appropriate to Mall	.Well designed high density buildings/ .Access to Mall level critical and must be handled properly .High quality important	.City should encourage bringing people downtown/ .Mall rundown; City's maintenance budget insufficient/ Parking insufficient/ .Confusion over objectives for Mall
9.	Retail and office with emphasis on specialty mix of retail centre of the financial community/ cinemas and restaurants welcome.	Good building/Frontage could be better at ground level/Acts as an anchor in conjunction with 24U Sparks/Asset to the Mall	.Improvement of existing buildings but not so as to endanger present retail variety	.Parking insufficient particularly for evenings and Saturdays/ .Mall identity to be distinct from Rideau Centre
10.	Quality retail and office use	A plus for the Mall/ Aesthetically pleasing but needs better frontage treatment	.High density, aesthetically pleasing with direct access to Mall for retail/Must be quality and must be viable/Private sector can do good design but not under current restrictions	.City seems confused about role of Mall/ .Future of Mall seems negative given certain City actions, e.g. Centretown traffic plan emphasis on transit and Height Bylaw/ .Parking is insufficient.
11.	Mall is a commercial street/Retail, office mix should be encouraged Residential should be looked at although not necessarily for the two blocks	Public space treatment is not appropriate	.Compromise between low and highest density should be sought. More effort directed to public spaces/ .Good design should balance objectives/ Elevated pedestrian system may be fine but ground level should be first priority	.Parking is a problem and should be at least kept to its present levels
12.	Primarily retail streets	Building intrudes on Mall/ Frontage treatment not appropriate to Mall character.	.Compromise may be acceptable but must be controlled by City approval processes/ .Human scale and a good pedestrian environment critical.	.Important to reduce wind effects .Need restaurant/entertainment uses
Summary	Retail and office Small stores at Street level	Frontage treatment poorly done on Royal Bank Bldg.	Mix of building heights/ Maintain quality of pedestrian space/Good design vital	Parking a problem/ Mall must be a lively place/Mall quality must be maintained and enhanced.

suggestion that the City had lost sight of the role of the Mall as a shopping and financial district in the heart of Ottawa adjacent to the Parliament Buildings.

Several possible and reasonably distinct roles for the Sparks Street Mall emerged from the discussions with representatives of the City, concerned interest groups and other government agencies. These include perceptions of the Mall as:

1. a quality retail area which stresses exclusive and unique stores: quantity of retail in this option is less preferrable than quality, and the area should include restaurants and entertainment;

2. primarily a financial and office district with a de-emphasis on conventional retail trade along the Mall in favour of tourist-oriented retail, restaurant and entertainment services;

3. a combination of 1 and 2 above, with quality retail in the midst of a business/financial district;

4. a major shopping area with a better mix of retail types, mass merchandizing and restaurant and entertainment facilities: in this case consideration could be given to covering the Mall to enable year-round comfortable shopping;

5. simply a part of the downtown core where the redevelopment process should take its course without government intervention;

6. an important City space close to the Parliament buildings, yet distinct and identifiable as a financial/high quality retail area next to the seat of the nation's government: in this instance, efforts would be made to capitalize on the location through

interesting and exciting linkages to Parliament Hill views, pedestrian linkages and so on; and;

7. emphasis on the Mall as an open space area, with low rise development, retail and entertainment uses.

The degree of government intervention in the development process must be a function of the role intended for the Mall. City planning and municipal decision-making on matters such as these is not an exact science. Rather, it is a political process of trying to achieve consensus by taking into account the various interests and the impacts of alternative decision possibilities. The range of opinions expressed by the Sparks Street environmental study committee through individual interviews, through the reports submitted to the City as well as the minority report submitted reflect a broad range of opinion and serve to place in perspective various community and interest groups' aspirations for the Mall.

The environmental side of the redevelopment question has been studied at some length by the City. Economic and financial impacts, however, for both private landowners and for the municipality have not been clearly understood. Nevertheless, these form part of the equation in a final decision on appropriate zoning regulations.

5.0 REDEVELOPMENT OPTIONS

5.1 Introduction

To test the impacts of possible changes in the zoning regulations on the two study blocks, several hypothetical redevelopment options have been identified. These concepts have been prepared based on a principle of maximum development available under the zoning regulations to ensure that the full ranges of potential impacts are identified. These options and the process followed in selecting them are described in the following paragraghs.

5.2 Land Assembly

The actual development which occurs in small blocks similar to those under study depends a great deal on the degree of land assembly which has occurred. Generally, if a developer is able to consolidate properties in a manner that permits reasonably proportional sites with good access from several frontages, he has more scope for imaginative and generally efficient building designs. If developers are unable to consolidate properties, the development and redevelopment of a block can be significantly limited simply because of difficulties in creating efficient building forms.

Two general land assembly patterns were selected for the preparation of the development concepts: the first involved redevelopment of selected sites within the two block study area; and the second involved one full block redevelopment in combination with redevelopment of selected sites in the second block. The criteria used in selecting the land assembly options were:

a. a cross-section of smaller redevelopment sites located in different parts of a block including through block development, development on the Sparks Street frontage only or the Queen Street frontage only, and corner sites; and

b. larger assemblies which reflect current ownership patterns.

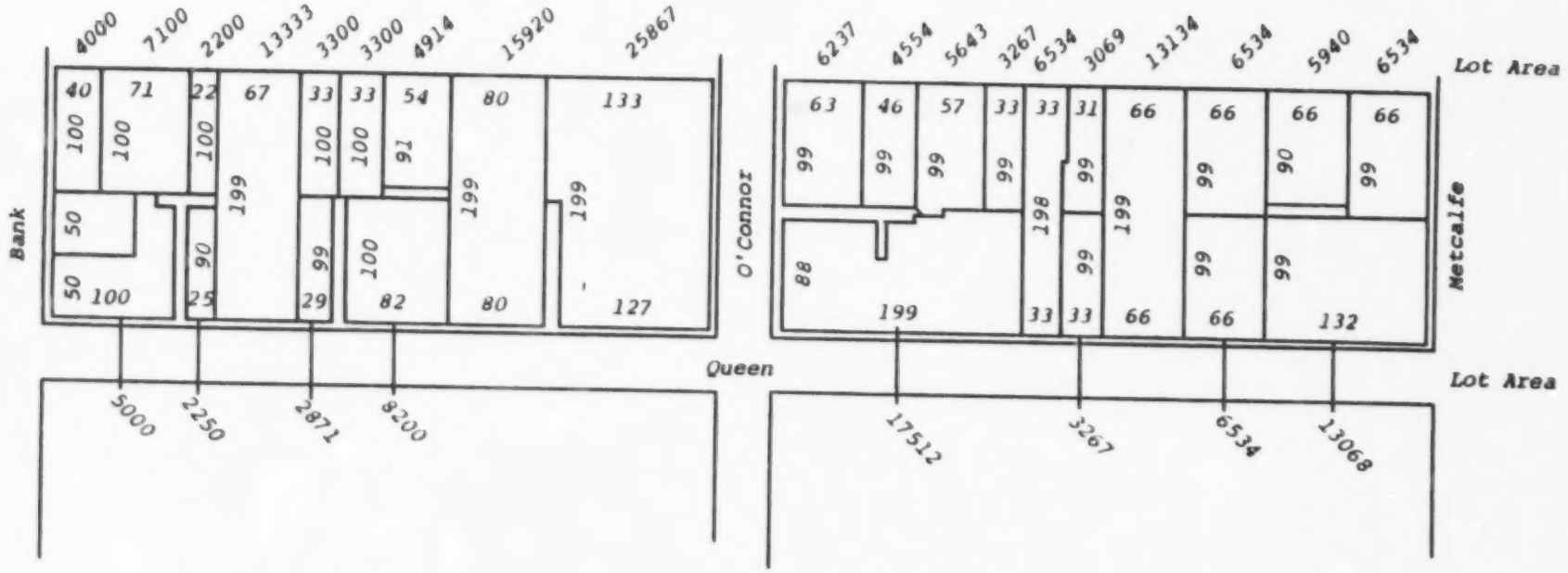
The selection of land assembly patterns therefore required a balancing of the criteria to ensure a representative set of development situations. The approximate property dimensions of the existing properties are shown in Exhibit 5.1. Exhibits 5.2 and 5.3 indicate the selected land assembly options which were used as the basis for preparation of the development concepts. Exhibit 5.2 also shows two sites which were considered for renovation as opposed to redevelopment.

5.3 Building Envelopes under Bylaw Options

The zoning bylaw proposed by the City would limit buildings to a 45 foot height on Sparks Street with further building forms defined by a 26 degree angle from the 45 height limit on Sparks extending southward to Queen Street. This is a significant change from the present bylaw which permits buildings to a height limited by the so called parliamentary height precinct (approximately 200 feet from street level) and by a maximum permissible floor space index of 8.0.

For the purposes of identifying impacts, these two sets of bylaw regulations were taken as the two extremes for development. In order to determine a range of impacts between these two extremes, an intermediate hypothetical bylaw was developed after consideration of several options including use of 45 and 60 degree envelope constraints. These options were presented to City officials and the Sparks Street Committee and are outlined in Appendix E. Based on the combined professional judgement of the study team members and consideration of the conceptual intent of the City's action, it was decided to proceed with an intermediate bylaw, based on the same principles as the City's proposed bylaw, with an identical height limit on Sparks Street of 45 feet but a less restrictive building envelope angle of 38

EXHIBIT 5.1: PROPERTY DIMENSIONS - APPROXIMATE



Dimensions in Feet

EXHIBIT 5.2: PARTIAL ASSEMBLY OPTION

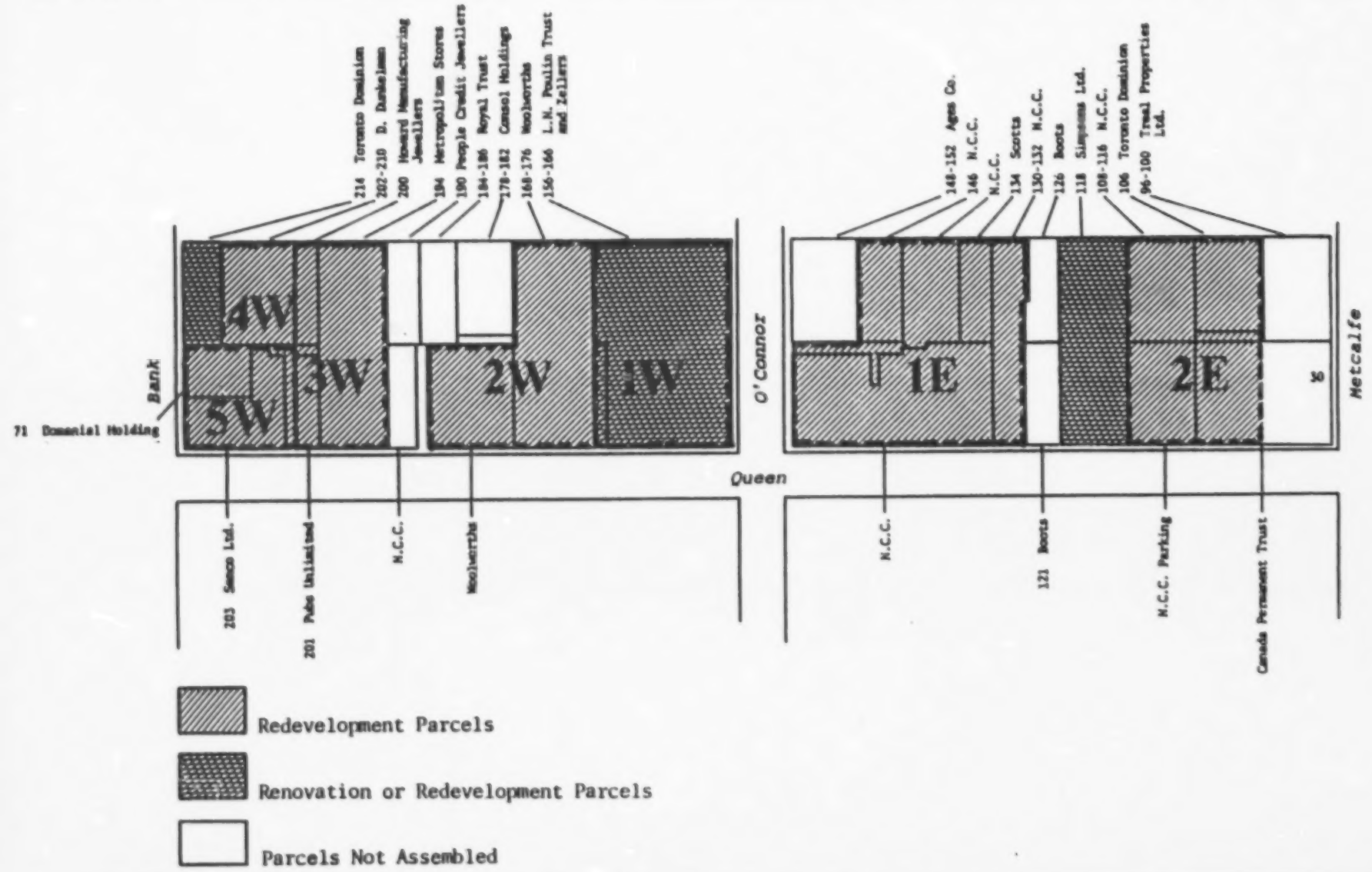
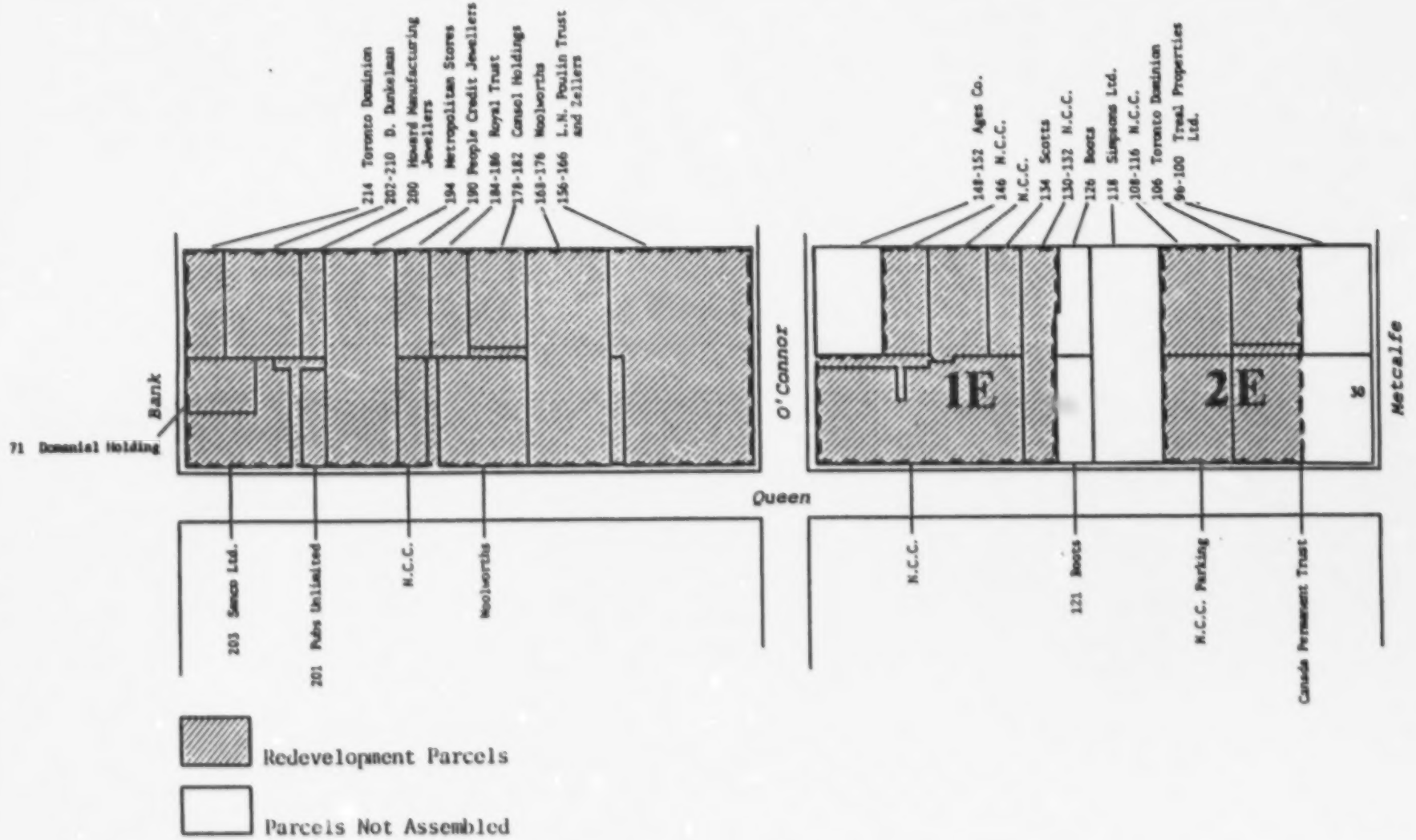


EXHIBIT 5.3: FULL BLOCK ASSEMBLY OPTION



degrees instead of the 26 degrees. The 38 degree angle was selected because it permitted sunlight penetration to the Mall from about February to October and would enable a general form of sensitivity test of the City's bylaw, above and beyond identifying the full range of impacts by analysing the two extremes.

5.4 Building Constraints and Criteria

All of the development options considered for this study were prepared taking into account a common set of characteristics and constraints. Exhibit 5.4 summarizes the common site planning considerations used. These zoning/planning constraints, discussed previously in Chapter 3 of this report, have been identified in consultation with City and/or regional agencies as appropriate.

A number of building program assumptions were used in preparing the development concepts and these are identified below.

1. Building characteristics -

   a. A floor to floor distance of 12 feet was used for buildings located on the large land parcels and 11 feet for the smaller land parcels.

   b. For through block land parcels, atriums were included in the building design at mid block to provide window space and increase leasing potential. Atrium widths were assumed to be 15 to 20 feet and, where possible, elevator cores were included within the atriums since this was considered advantageous from a marketing point of view.

   c. Based on architectural and marketing experience, a desirable building floor size is approximately 15 to 20,000 sq. ft., with 8,000 sq. ft. as a minimum size. In all cases an attempt was made to design

EXHIBIT 5.4: SITE PLANNING CONSIDERATIONS

	BANK/O'CONNOR	O'CONNOR/METCALFE
1. General Block Characteristics		
- Block Length	534'	528'
- Block Depth	199'	199'
- Block Area	106,067 sq. ft.	105,072 sq. ft.
- Elevation Sparks	237,8' (varies)	250' (varies)
- Elevation Queen	235' (varies)	240'
2. Zoning/Planning Constraints		
- Land Dedication for roadways	3' on all streets	3' on all streets
- Sidewalk Requirements	8' + 5' ground level setback	same
- Setbacks	5' ground level only	same
- Permitted Heights (Pre-holding Bylaw) - Sparks	194'	192'
- Queen	197'	202'
- Access to Parking	Queen only	same O'Connor
- Service Access	Queen or O'Connor	Queen, or Metcalfe
- Elevated Pedestrian System Requirements	17 ft. above travel way; 15 foot width, 9 foot height; enclosed	same

building floors based on these guidelines except where this site itself was below 8000 sq. ft.

d. The service core to outside wall distance was assumed to be optimal at about 30 ft. For certain of the C-2/8.0 zoning option parcels, distances are somewhat greater because of site sizes. Office floor areas were designed where possible to offer simple layouts and provide for easy division with an assumption of about 90 to 92 percent rentable space for full floors and about 85 percent for sub-divided floors.

e. Smaller building floors created under the angle controls (either the 26 or the 38 degree angle) were not included in the concepts because of the difficulty and costs of providing core service. The floors are those at the tops of the buildings where the angular controls require stepped floors of increasingly smaller sizes as the Queen Street boundary is approached. The resulting 1 to 2 floors at the top of these buildings would require special core services which are inordinately expensive for the small floors involved.

f. In keeping with the City's proposed bylaw, no penetration of the zoning angle regulations was assumed by any portion of a proposed building (including elevator floors or mechanical penthouses).

2. Land Uses

a. Mixed office/retail buildings were assumed to have retail space occupying the ground floor and associated with the elevated pedestrian system where appropriate.

b. The average tenant size for office space, excluding government departments, was assumed to be approximately 5,000 sq. ft.

c. To maximize retail exposure and character on Sparks Street, entrances to offices were assumed to be from side streets or adjacent streets where possible.

d. No provision was made for public space recesses on Sparks Street so as to retain the focus of pedestrian - related activity on the Mall itself.

e. Interior malls were not included within buildings so as not to compete with retail on Sparks Street.

f. Entrances to retail space on Sparks Street were assumed to be available only off the Mall itself.

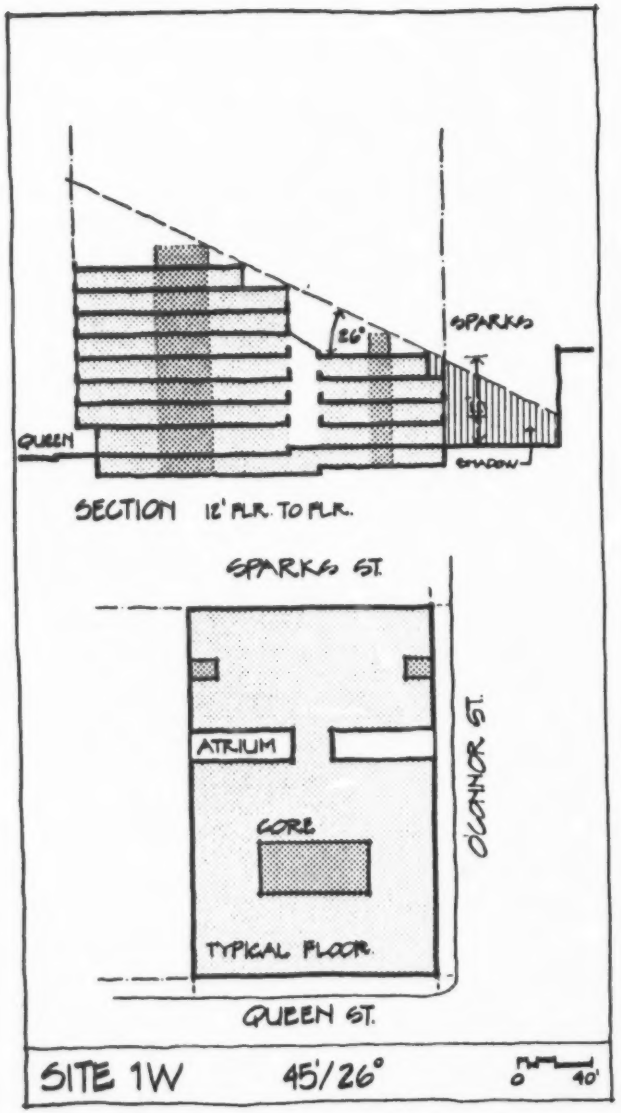
In addition to the building program, an assumption was made that redevelopment in any portion of the two study blocks would be of high quality, resulting in prime office and retail space.

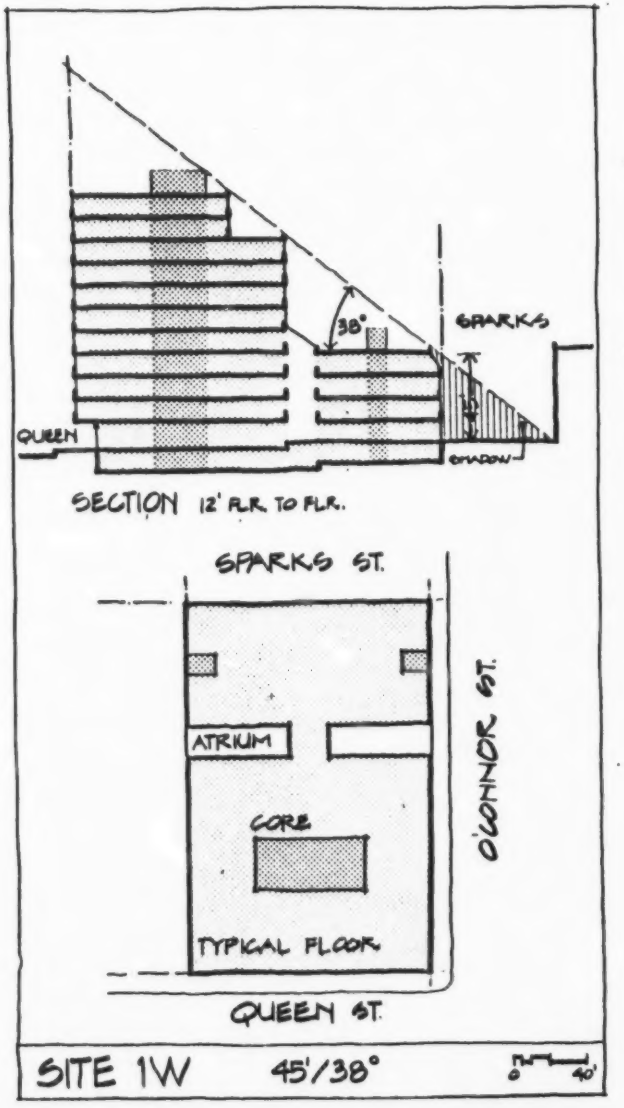
5.5 Development Concept Descriptions

Exhibits 5.5 to 5.12 illustrate the section and plan development concepts for selected land parcels. These building concepts indicate the range of possibilities for a variety of parcel types (not all are included since some are similar in nature) under each of the zoning policy scenarios. The site numbering corresponds to the site identification in Exhibits 5.2 and 5.3 previously. Exhibits 5.13 and 5.14 show axonometric sketches of a full block development and sample site(3W).

As mentioned previously, the design solutions for through block sites under angular controls presume an atrium located at mid-block to allow light penetration and increase leasing potential. In effect, for through block sites the angular

EXHIBIT 5.5: SITE 1W - ZONING POLICY OPTIONS





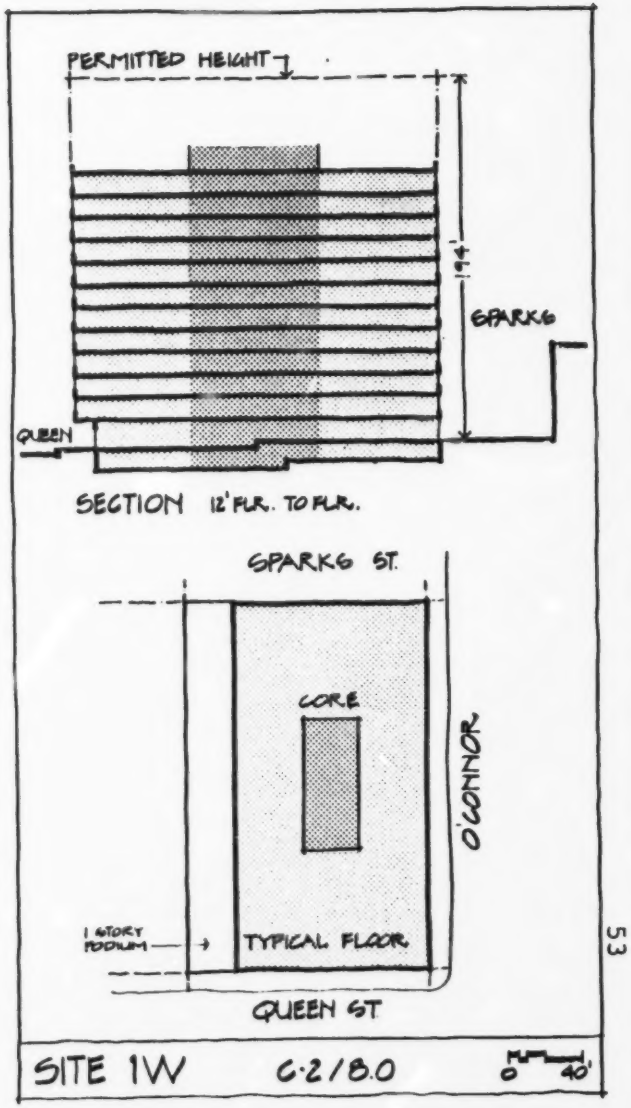
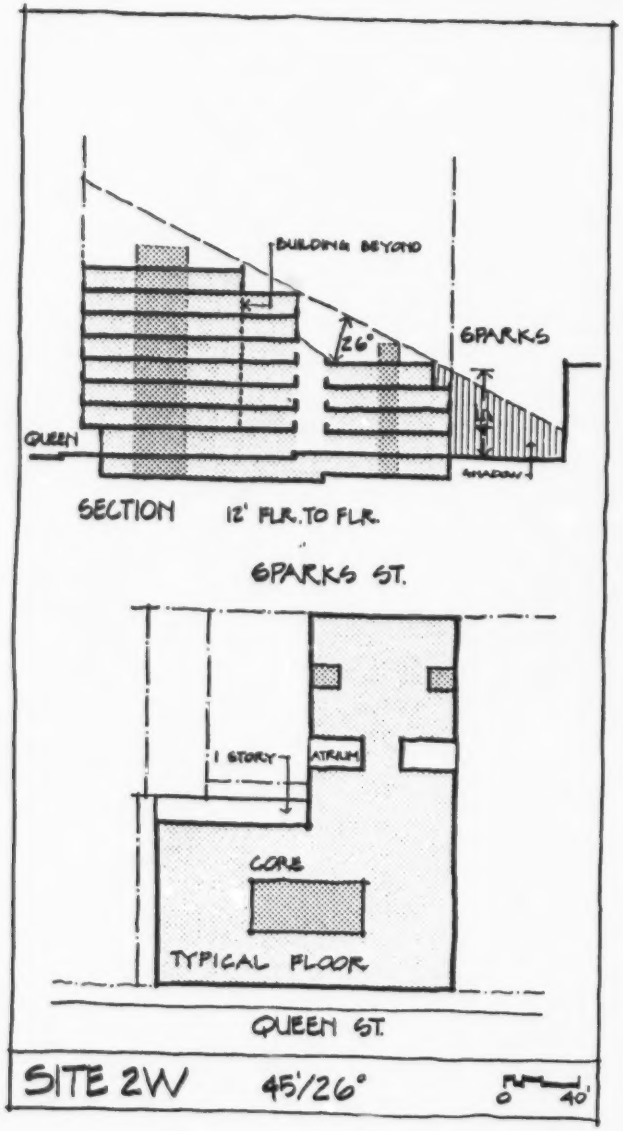
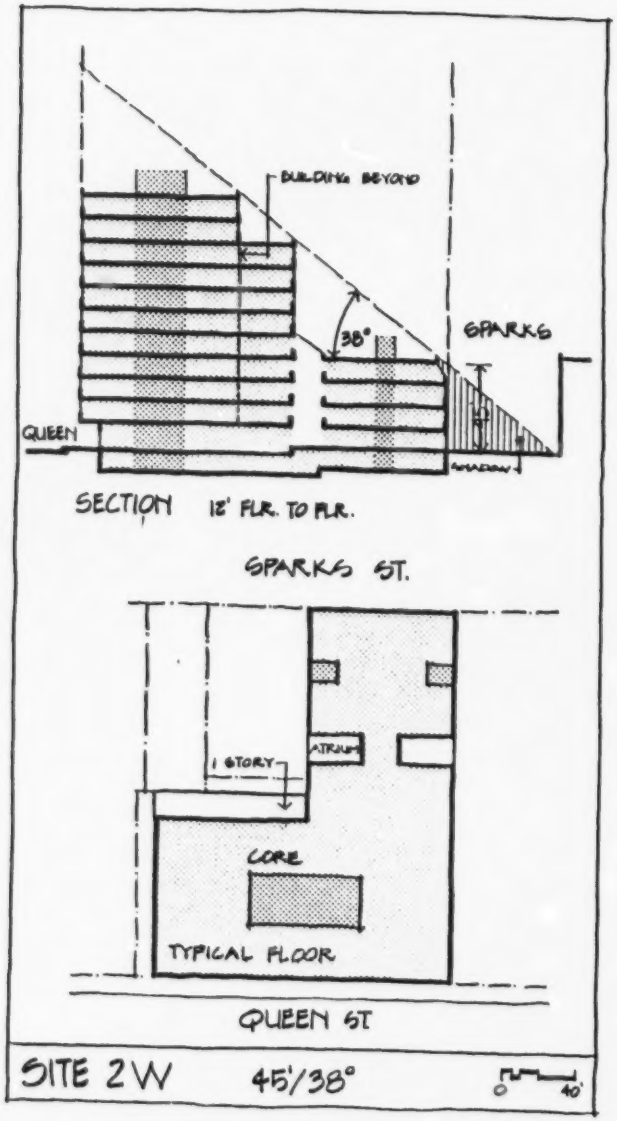


EXHIBIT 5.6: SITE 2W - ZONING POLICY OPTIONS





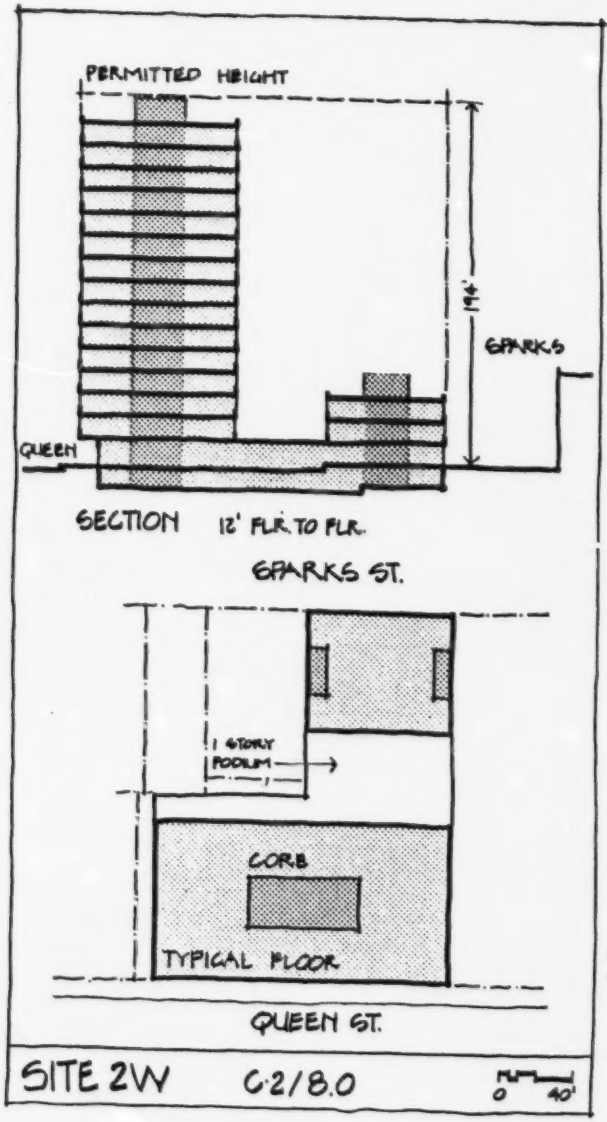
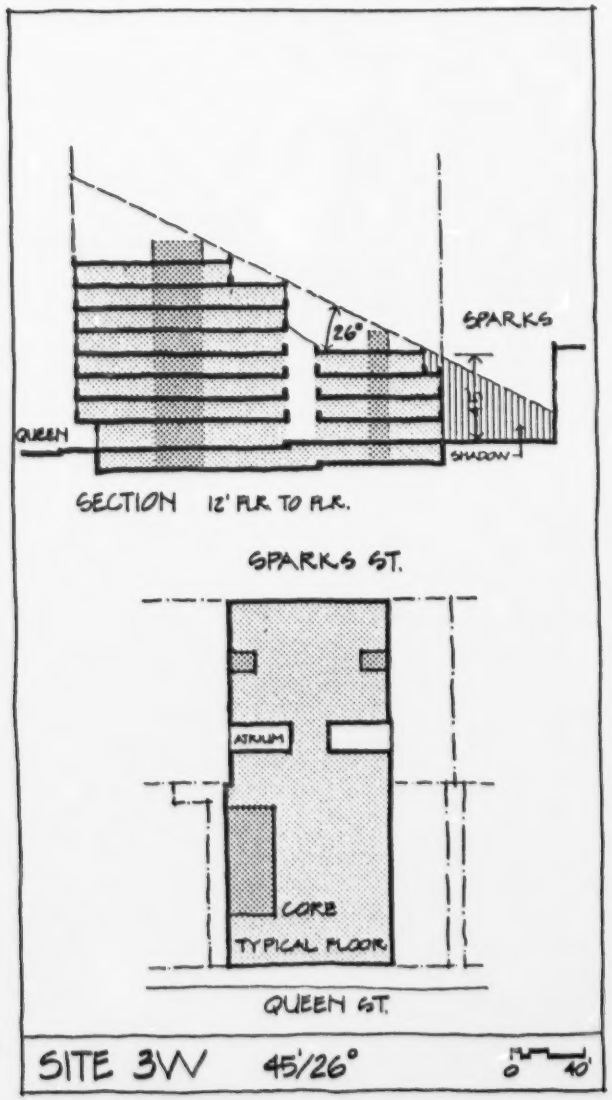
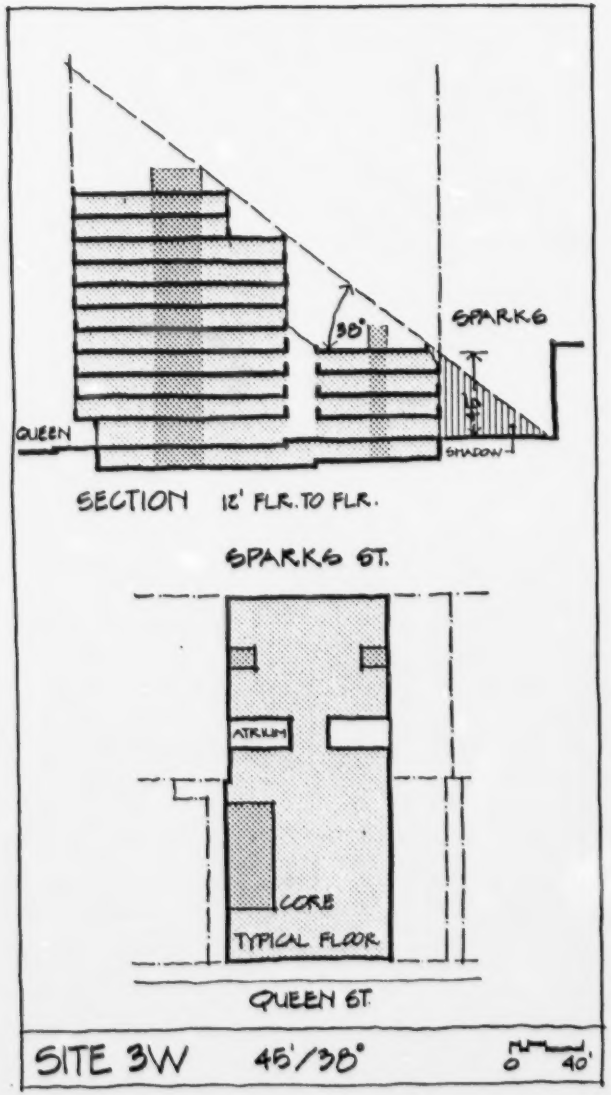


EXHIBIT 5.7: SITE 3W - ZONING POLICY OPTIONS





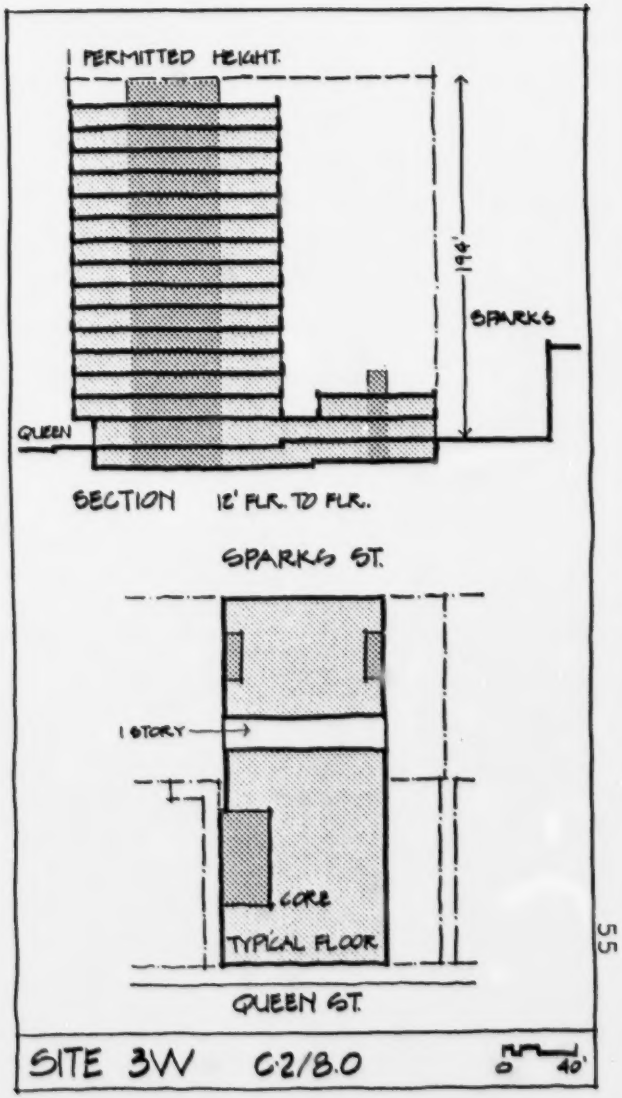
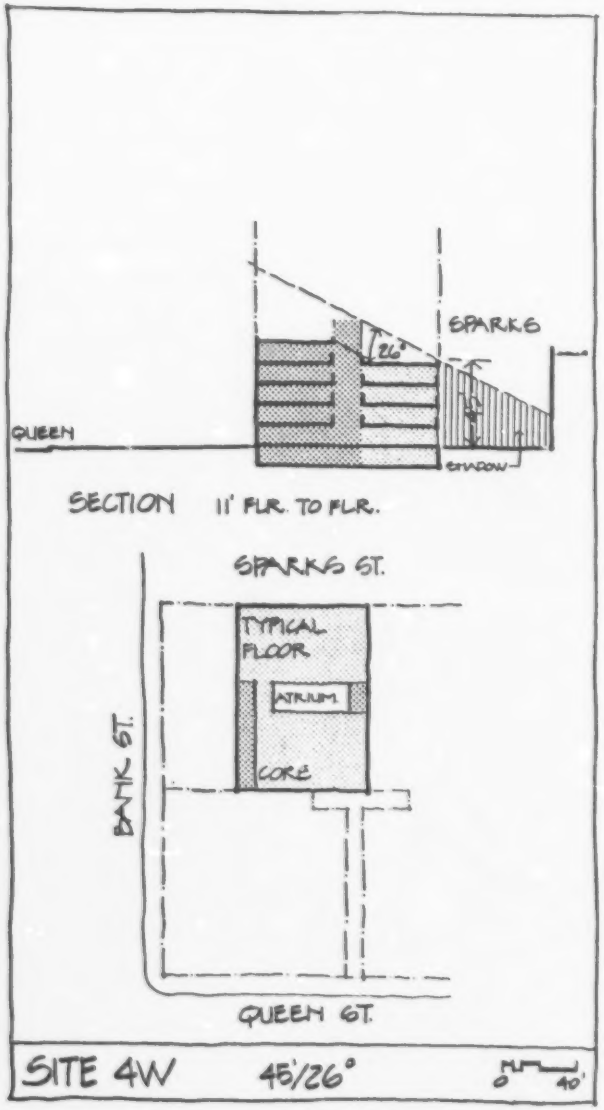
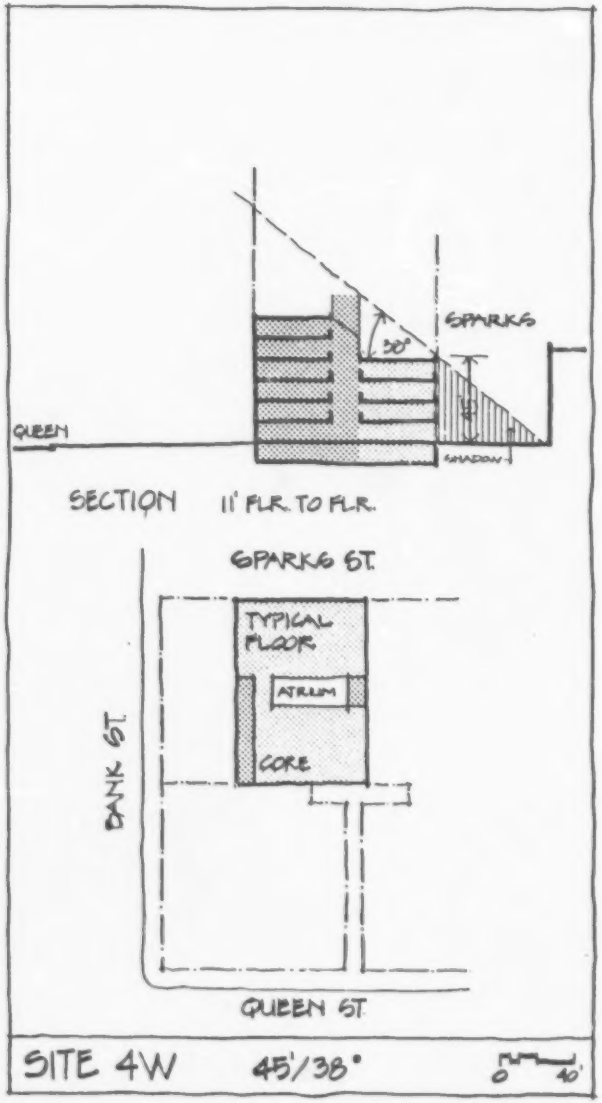


EXHIBIT 5.8: SITE 4W - ZONING POLICY OPTIONS





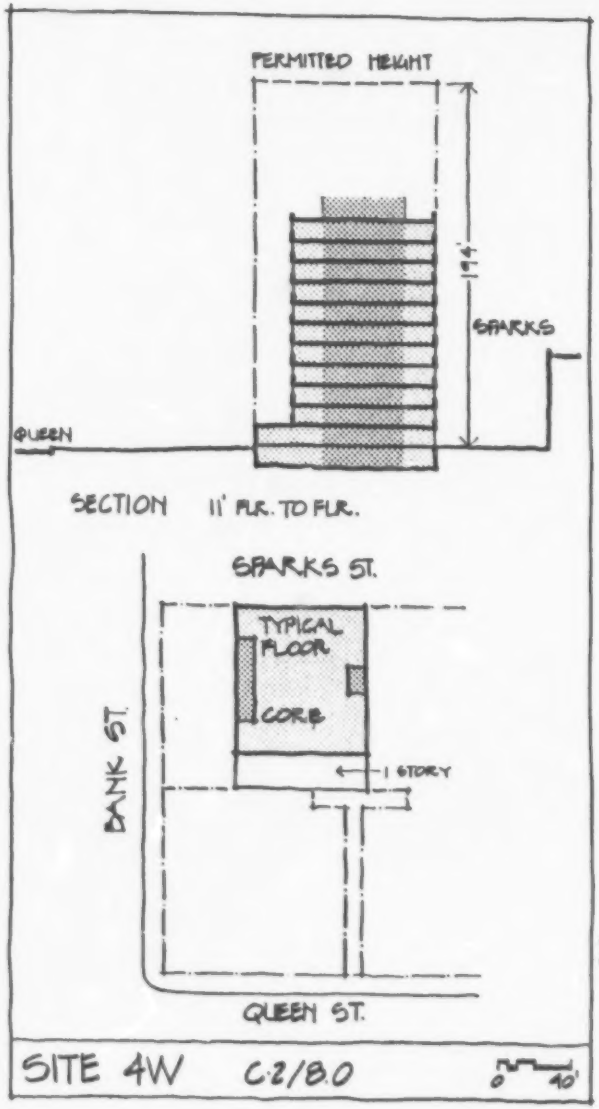
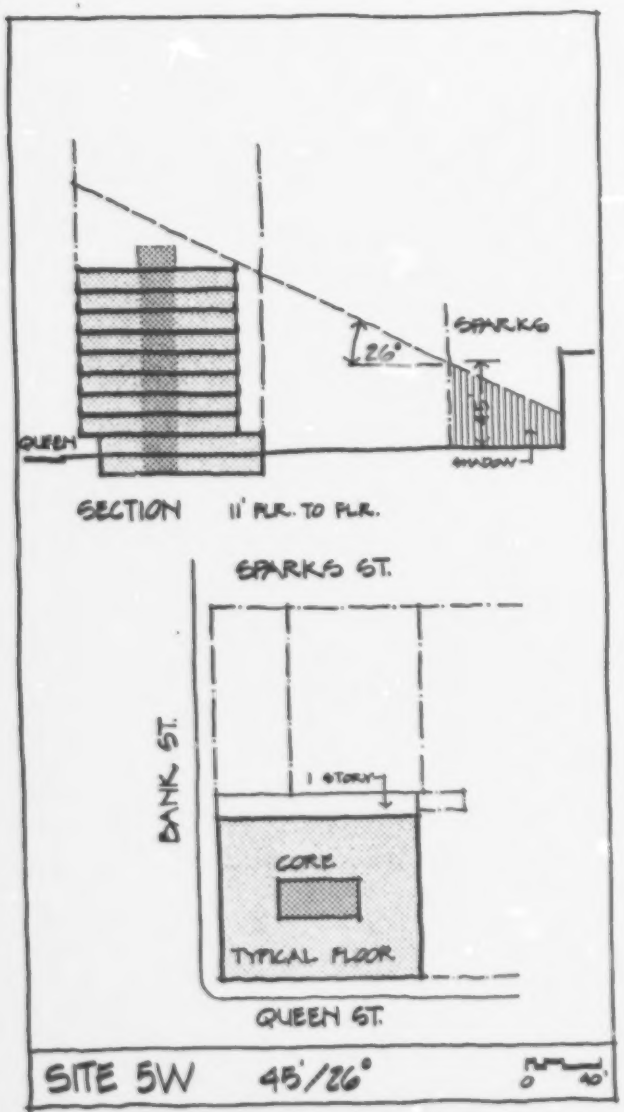
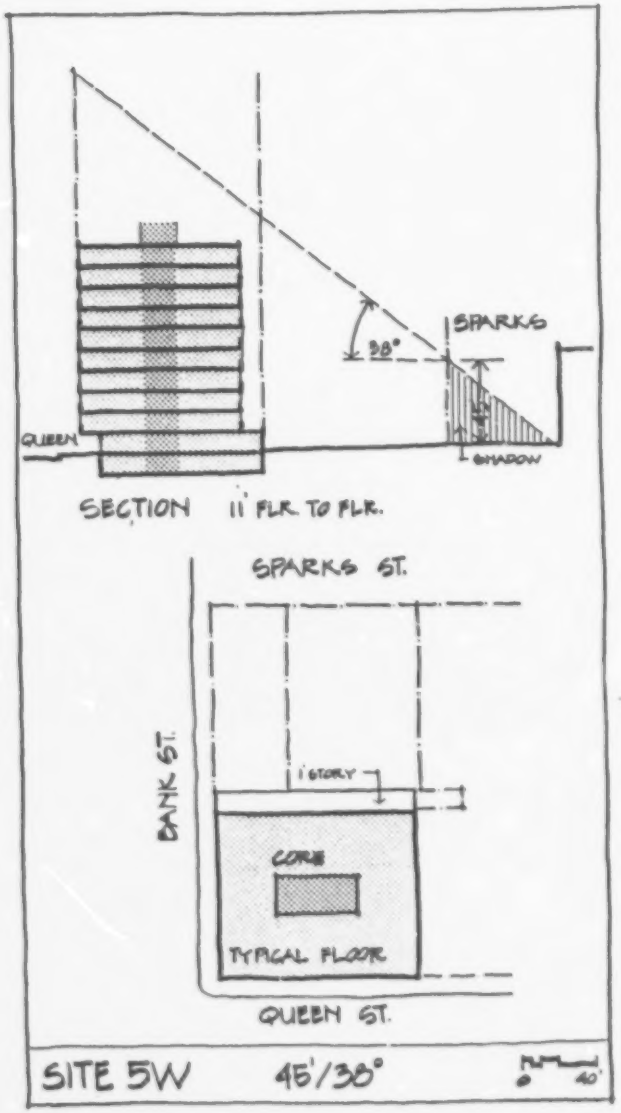


EXHIBIT 5.9: SITE 5W - ZONING POLICY OPTIONS





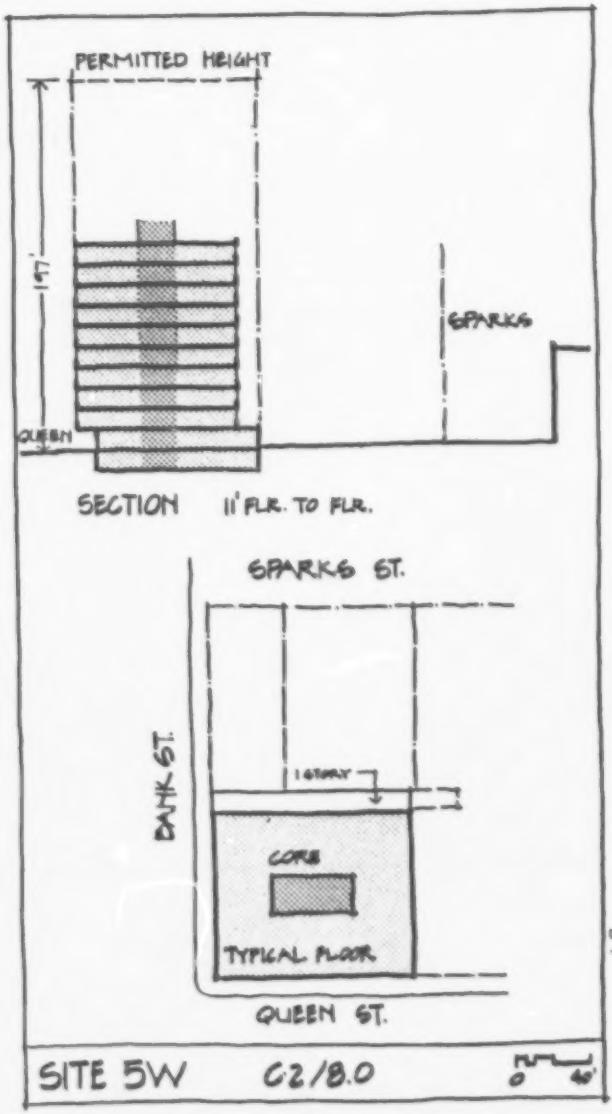
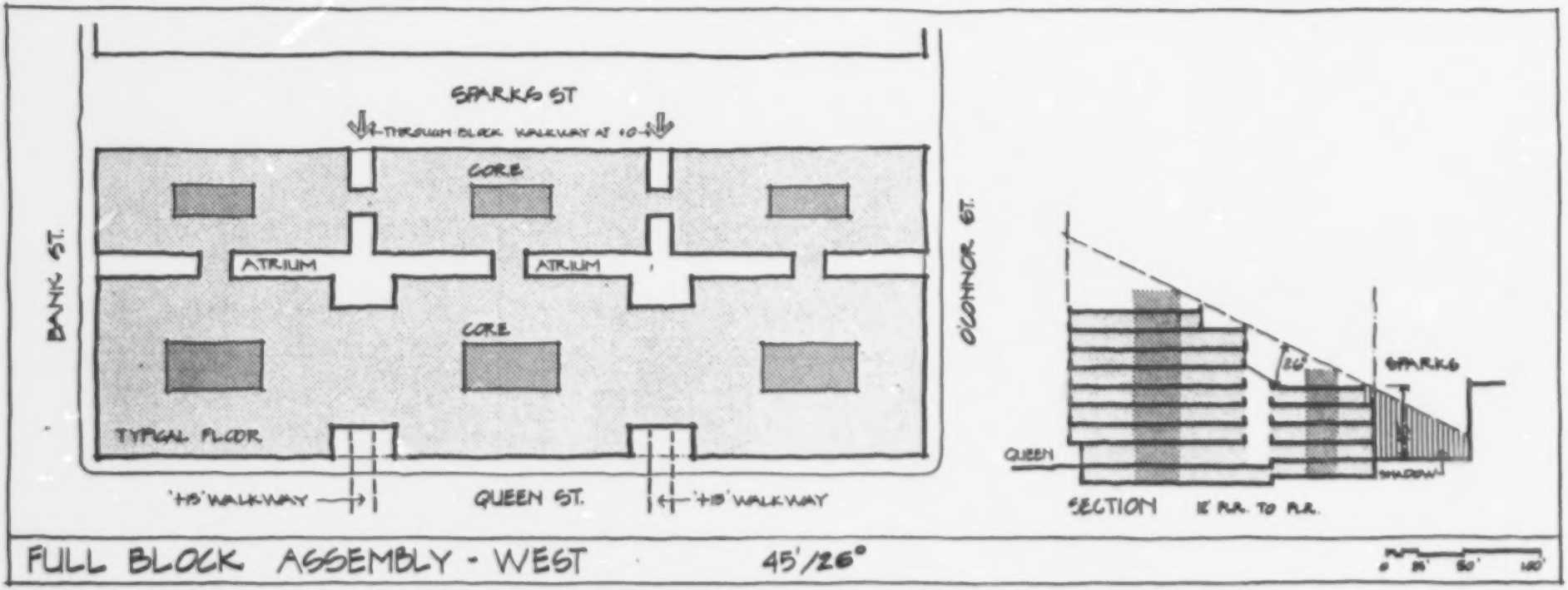
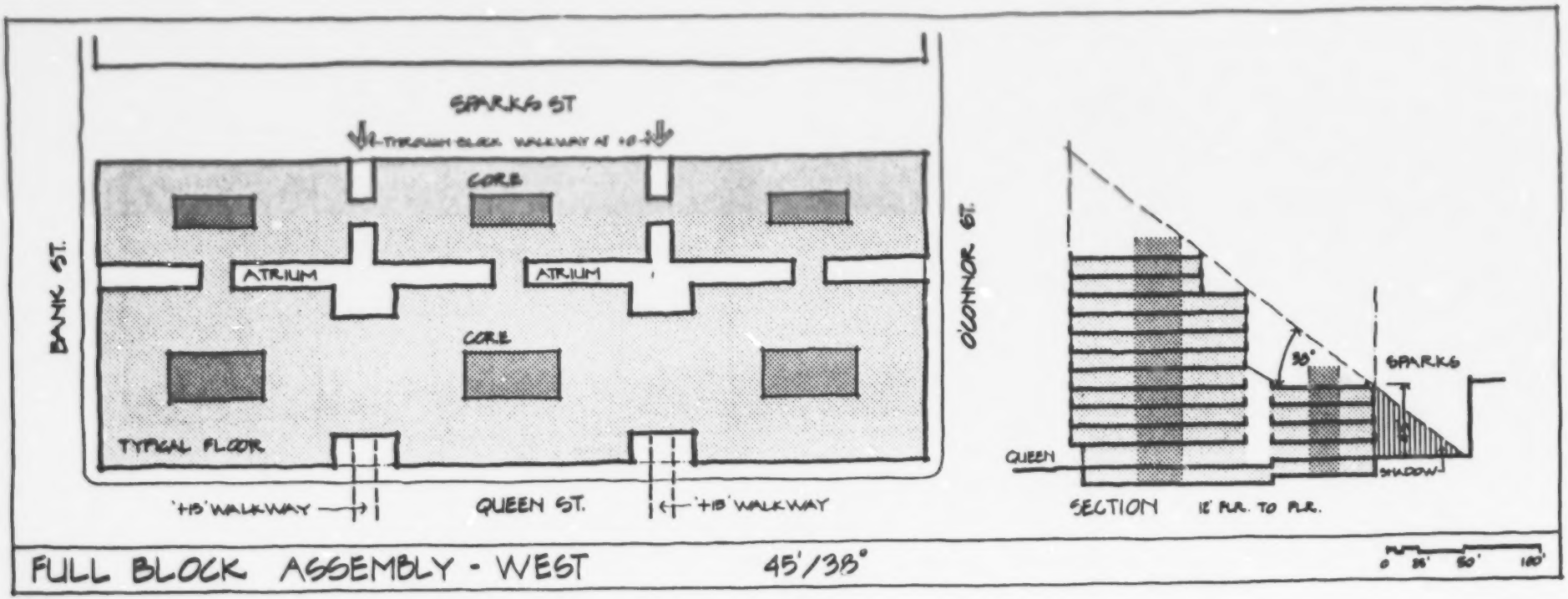


EXHIBIT 5.10: FULL BLOCK DEVELOPMENT - 45'/26 DEGREES



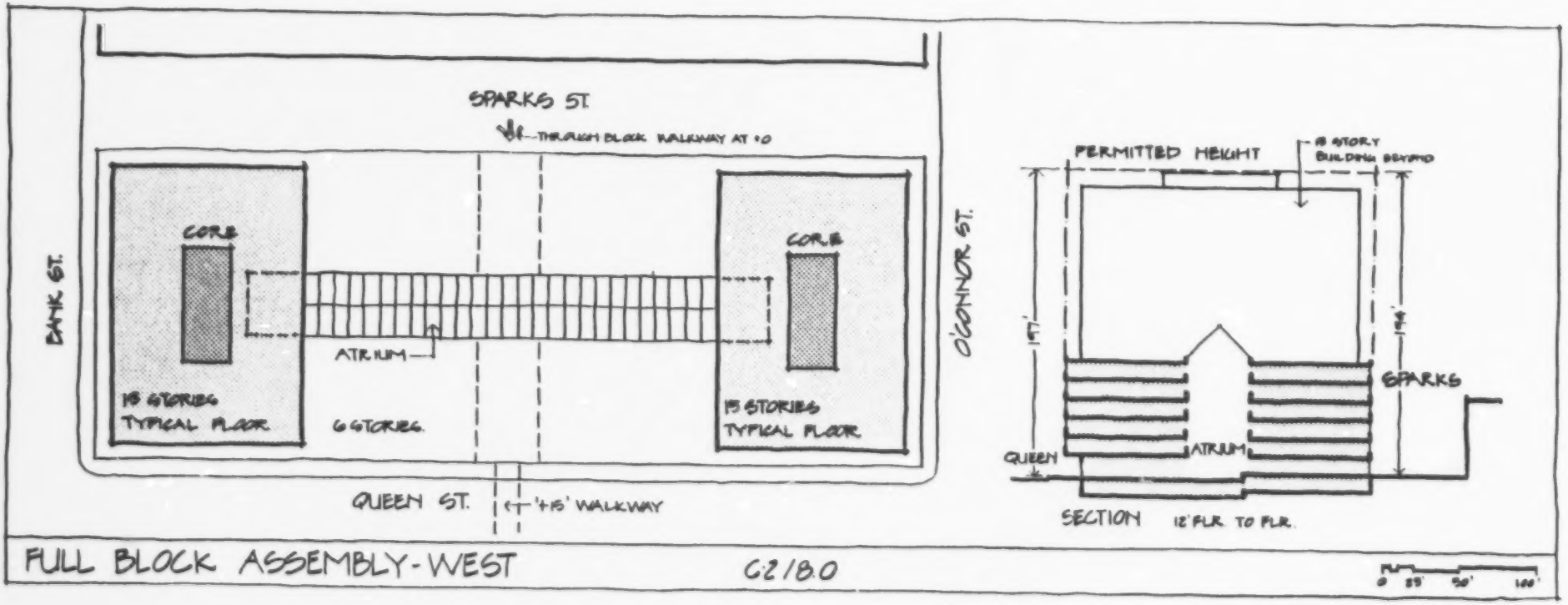
FULL BLOCK ASSEMBLY - WEST 45'/26°

EXHIBIT 5.11: FULL BLOCK DEVELOPMENT - 45'/38 DEGREES



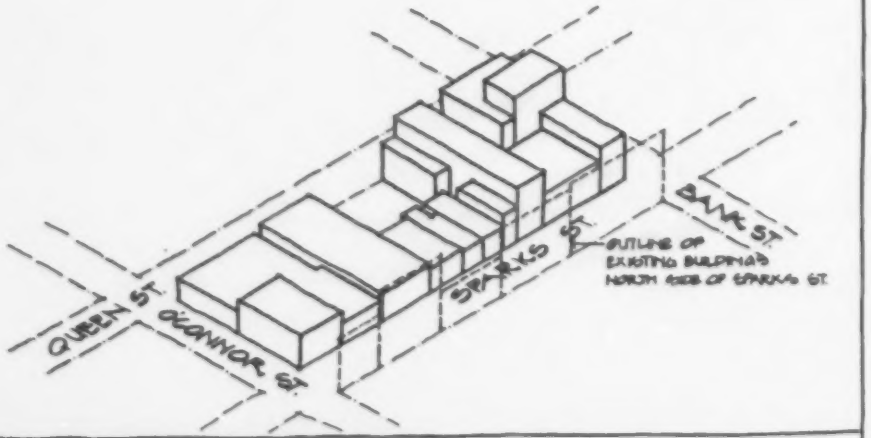
FULL BLOCK ASSEMBLY - WEST 45'/38°

EXHIBIT 5.12: FULL BLOCK DEVELOPMENT - C-2/8.0

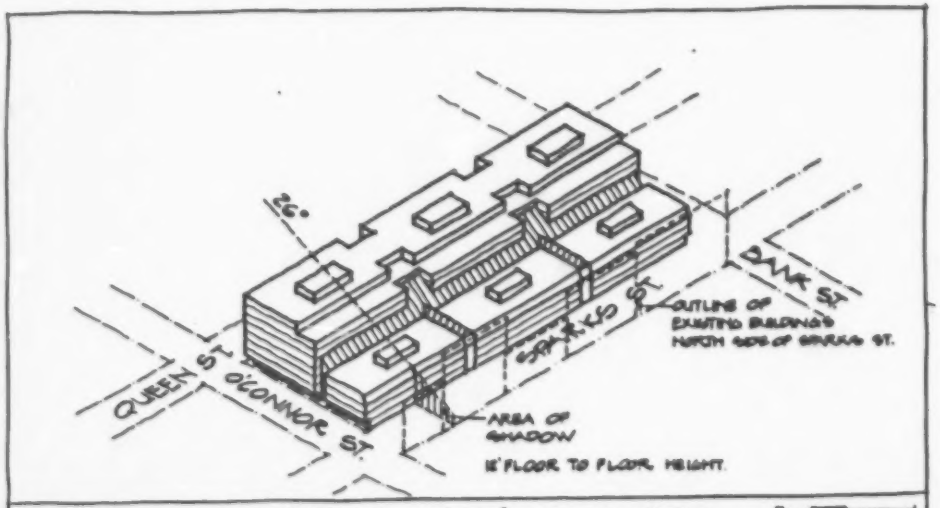


FULL BLOCK ASSEMBLY-WEST C2/8.0

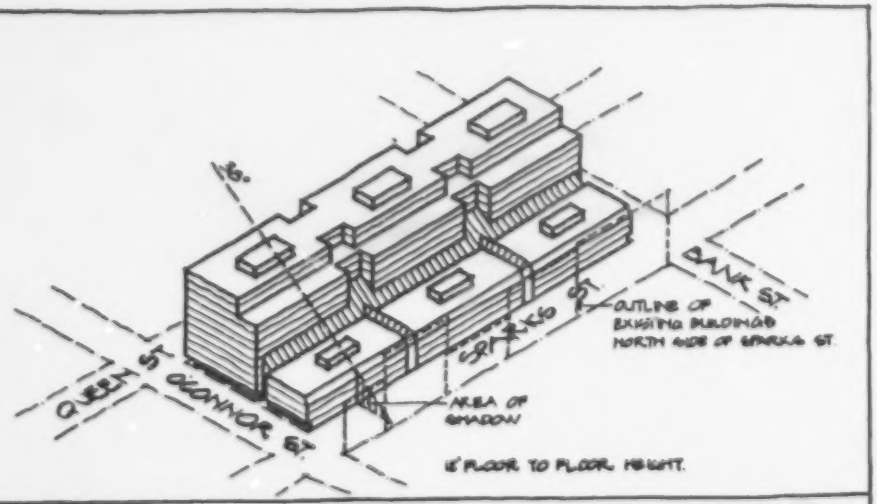
EXHIBIT 5.13: FULL BLOCK DEVELOPMENT - AXONOMETRICS



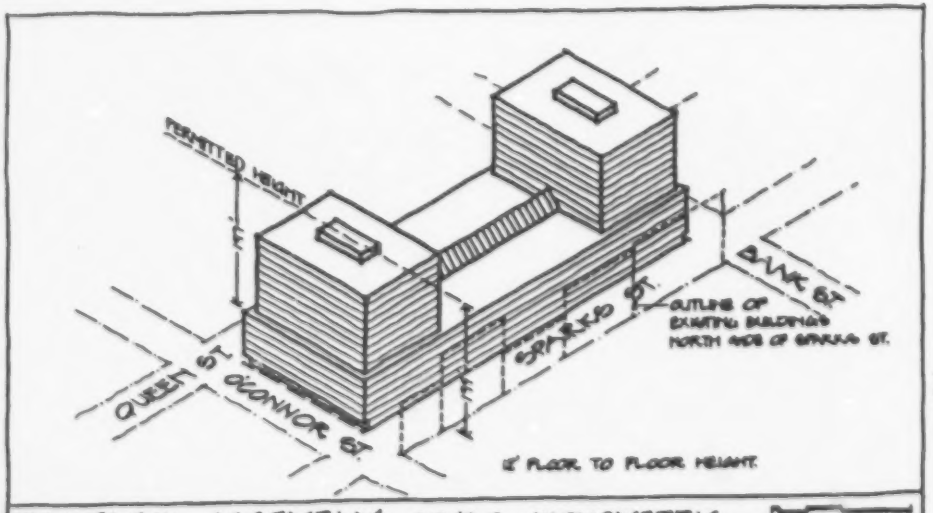
WEST BLOCK EXISTING DEVELOPMENT AXONOMETRIC



FULL BLOCK ASSEMBLY 45/26° AXONOMETRIC

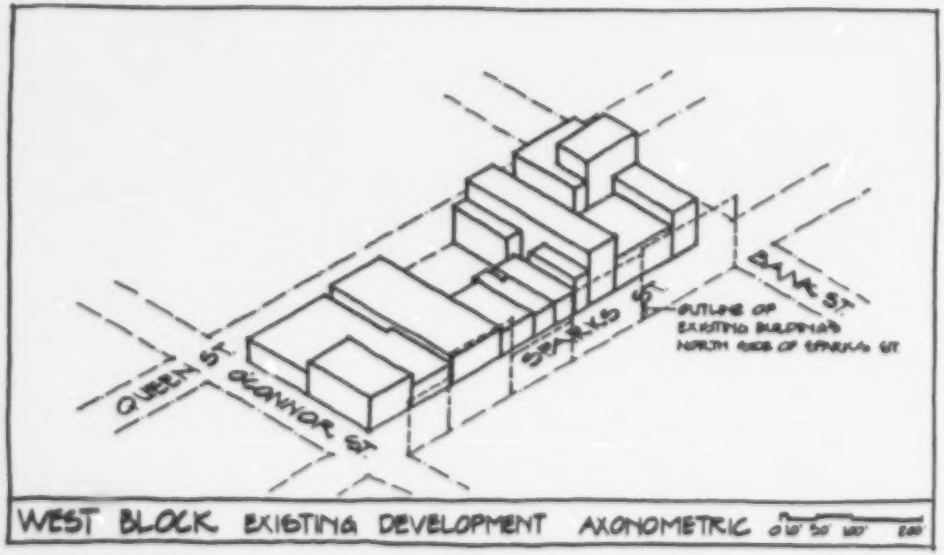


FULL BLOCK ASSEMBLY 45/38° AXONOMETRIC

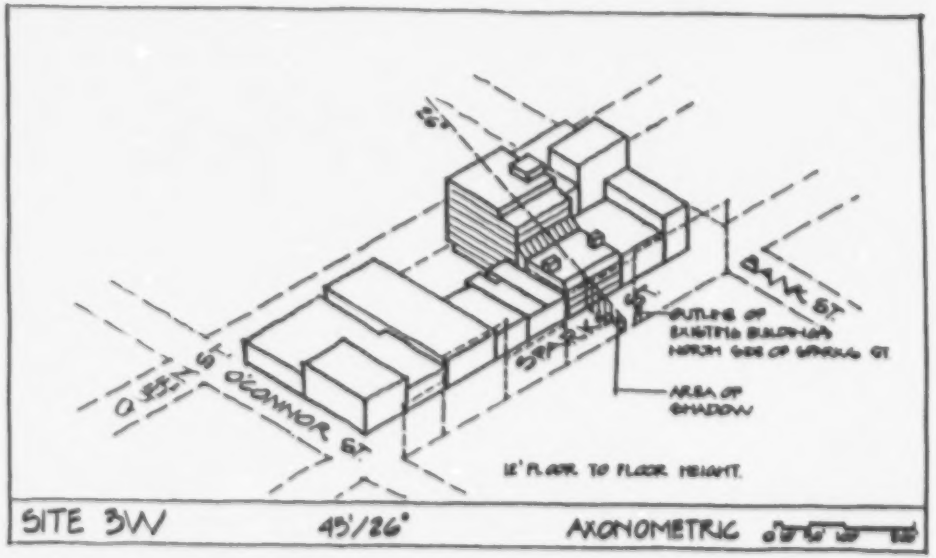


FULL BLOCK ASSEMBLY CZ/80 AXONOMETRIC

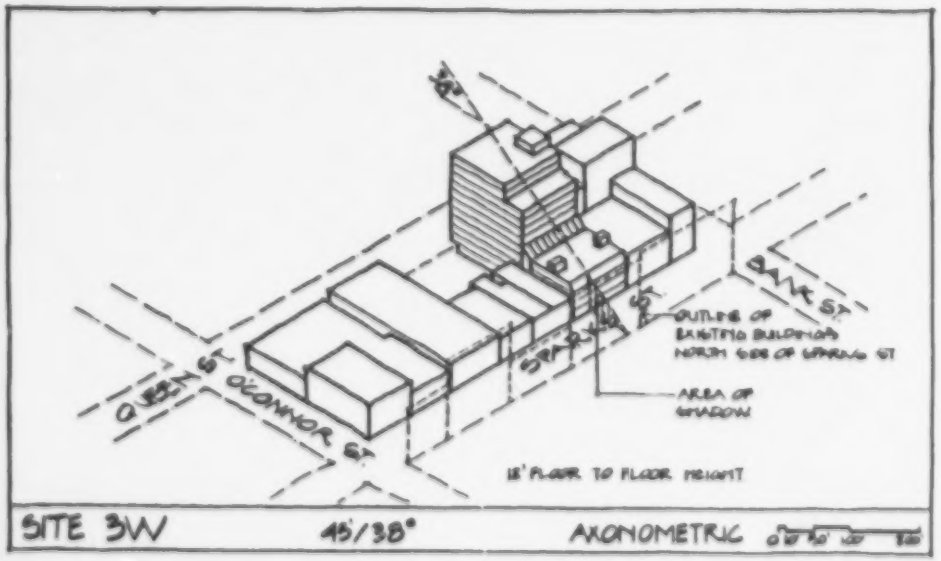
EXHIBIT 5.14: SITE 3W - AXONOMETRICS



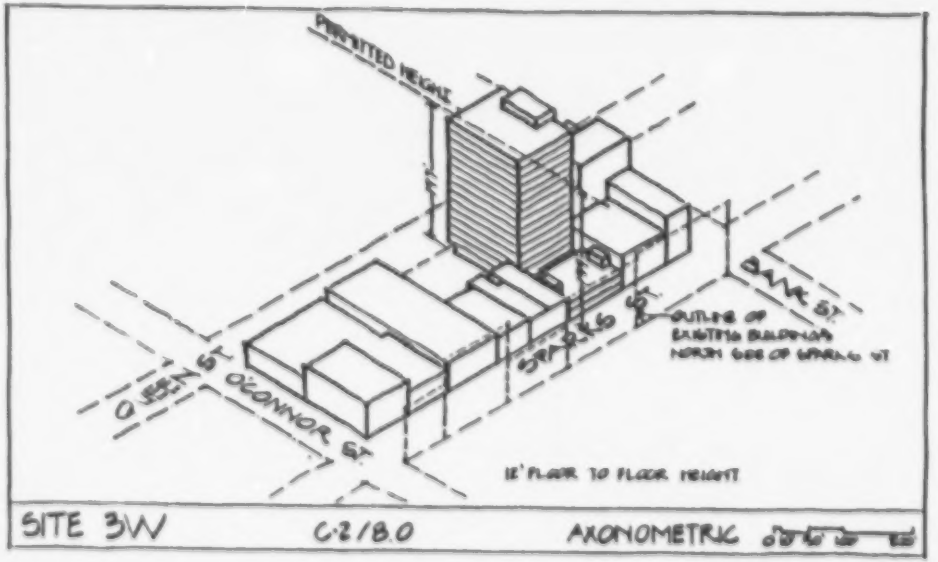
WEST BLOCK EXISTING DEVELOPMENT AXONOMETRIC



SITE 3W 45/26° AXONOMETRIC



SITE 3W 45/38° AXONOMETRIC



SITE 3W C-2/8.0 AXONOMETRIC

controls create two distinct parts to any building, with the low portion located on Sparks Street and the higher portion facing on Queen. To minimize the number of cores required, corridor access across the atrium space was provided. Greater amounts of floor space could be considered but the resulting building concepts are unlikely to be attractive to potential tenants. These development concepts represent the maximum recommended floor space that balances the zoning bylaw constraints and judgements concerning marketability and development of quality buildings.

Exhibits 5.15 and 5.16 summarize the characteristics of each of the sites by land assembly and zoning policy options. The assumed floor to floor heights, the gross floor area, the resulting FSI calculated by using the City's zoning bylaw definition, and the site areas are given. The gross floor space calculations do not account for the three foot roadway dedication requirement and, therefore, floor spaces are overstated by a marginal amount. The difference is insignificant and does not affect the analysis results.

For the partial assembly option, the exhibits indicate that FSI ranges from about 5.1 to 8.0. The 45 ft./38 degree option has an overall FSI of about 7.3, relatively close to the 8.0 maximum. In the full block assembly option, the FSI ranges from 4.8 to 8.0. For this option the 45 ft./38 degree option FSI is 6.2, lower relative to the C-2/8.0 option because of the configuration of these options over the full block.

Although the floor space index is not a direct controlling factor in the proposed angular zoning policy, the FSI calculations indicate the degree to which development potential is restricted by the angle controls. Generally, the sites most affected by the proposed angular controls are those fronting on Sparks Street, whereas sites which are located on Queen Street are least affected (for example, site 5W located on the corner of Bank and Queen Street).

EXHIBIT 5.15: SITE CHARACTERISTICS - PARTIAL ASSEMBLY OPTION

Zoning Policy	Site	Floor to Floor Height	Gross Floor (sq.ft.)	F.S.I.	Site Area (sq.ft.)
45 feet/26 degrees	1W	12'	157223	4.86	24467
	2W	12'	151224	5.06	24079
	3W	12'	109280	4.97	18009
	4W	11'	29786	3.8	7064
	5W	11'	84372	7.07	10746
	1E	12'	248629	5.07	40013
	2E	12'	156702	4.89	26268
Total (&FSI average)			937,216	5.07	151,609
45 feet/38 degrees	1W	12'	198851	6.28	24467
	2W	12'	197420	6.79	24079
	3W	12'	136504	6.83	18009
	4W	11'	33510	4.22	7064
	5W	11'	95424	8.0	10746
	1E	12'	321688	6.71	40013
	2E	12'	198348	6.31	26268
Total (&FSI average)			1,104,098	7.28	151,609
C-2/8.0	1W	12'	249323	8.0	26467
	2W	12'	229701	8.0	24079
	3W	12'	169759	8.0	18009
	4W	11'	62733	8.0	7064
	5W	11'	95424	8.0	10746
	1E	12'	378854	8.0	40013
	2E	12'	247156	8.0	26268
Total (&FSI average)			1,433,310	8.0	151,609

Note: FSI calculations are based on the City's Bylaw definition which excludes core space (elevators, service areas, etc.).

EXHIBIT 5.16: SITE CHARACTERISTICS - FULL BLOCK ASSEMBLY OPTION

Zoning Policy	Site	Floor to floor Height	Gross floor Area (sq.ft.)	F.S.I.	Site Area (sq.ft.)
45 feet/26 degrees	West Block	12'	614086	4.75	106067
	1E	12'	248629	5.07	40013
	2E	12'	156702	4.89	26268
Total (&FSI average)			1,019,417	4.8	172,348
45 feet/38 degrees	West Block	12'	770968	6.08	106067
	1E	12'	321688	6.08	40013
	2E	12'	198340	6.71	26268
Total (&FSI average)			1,290,996	6.2	172,348
C-2/8.0	West Block	12'	997487	8.0	106067
	1E	12'	378854	8.0	40013
	2E	12'	247516	8.0	26269
Total (&FSI average)			1,623,857	8.0	172,348

Note: FSI calculations are based on the City's Bylaw definition, which excludes core space (elevators, services areas, etc.).

6.0 IMPACT METHODOLOGY

6.1 Introduction

The analyses of impacts resulting from proposed changes in the zoning bylaw were undertaken on three primary fronts: direct impacts including financial, fiscal, demographic and traffic; retail trade impacts; and, environmental impacts. The basic approach used is one of comparison between a base case assumed to be the C-2/8.0 zoning policy and the two angular control zoning policy options. The general methodology used in the analysis is described below. The assumptions used are summarized below and outlined in more detail in Appendix B of this report.

6.2 Direct Impacts

Financial, fiscal, demographic and traffic impacts were calculated for each development option using a computer model with estimates based on the description of the building development program.

6.2.1 Financial Impacts - Methodology

Financial impacts were analyzed by calculating the residual land value of sites. The residual land value methodology is a way of estimating the development values of land based on net revenues and creation costs. Residual land values were calculated for each site and an average value was calculated for each land assembly option. Exhibit 6.1 illustrates the cost and revenue elements used in the residual land value methodology.

EXHIBIT 6.1: RESIDUAL LAND VALUE ANALYSIS - METHODOLOGY

CAPITALIZED VALUE OF NET RENTS:

as function of net rentable area by type, rental rates by type, vacancy rates and capitalization factor

LESS: CREATION COST OF DEVELOPMENT (excluding land):

as function of total floor area by type, construction costs and development costs

EQUALS: RESIDUAL LAND VALUE

6.2.2 Financial Impact - Assumptions

Residual land value analysis requires estimates of construction costs, and development costs (that is, the soft costs associated with development), the relationship between gross and net leasable space, vacancy rates, and on the revenue side, estimates of revenues per sq. ft. and the capitalization rate.

Construction costs were estimated by quantity surveyors based on hypothetical architectural designs under each of the three zoning policy options, that is, the 45 ft./26 degree, 45 ft./30 degree and the C2/8.0 options. The resulting estimates of construction costs (excluding demising) were $75.68, $69.51, and $64.61 respectively for each of the three zoning policies. These estimates are overall per sq. ft. costs, accounting for a mix of office and retail uses and assuming ground floor retail uses.

The C2/8.0 zoning option produces the lowest construction costs per sq. ft. because it involves a more efficient construction program without the necessity to account for stepped buildings as is the case under the angular zoning options. It was assumed that high quality buildings would be constructed with high speed elevators and with a 50 per cent glass to concrete proportion for exterior walls excepting ground floor levels, (assumed to be all glass exteriors). These estimates take account of the geology of the development sites. The estimates of course can vary depending on actual building designs but they do serve to indicate the relative differences between zoning options.

Development or soft costs are assumed to be 47.6 per cent of construction costs (see Appendix B). These costs include professional fees, development overheads, leasing commission and marketing costs, interim financing for both construction costs and soft costs and a development management fee. The development costs do not include the cost of interim financing for land.

The residual land analysis calculates residuals for land value assuming that the land is readily available at the time of construction. Therefore, if there is a delay in development the residual land values produced must be adjusted based on some assumptions concerning the interim financing of land and land assembly costs. These costs can vary dramatically by site depending upon the size of the site, the number of properties involved and the time required for land assembly. A discussion of this adjustment is made in more detail in Chapter 7 below. The soft costs assume, for interim financing, a 14 per cent interest rate and a 1.5 year construction period. This rate is about 2 points above prime and should be obtainable by experienced developers. Again, this interest rate can vary depending on the size of the development and the smaller developers may indeed have to pay a premium above this rate. However, for the purpose of analysis it was assumed that the 14% rate would be obtainable for each redevelopment site.

Vacancy rates were assumed to be 4 per cent for all floor space types. Estimates of non-leasable space vary between zoning policies. The C2/8.0 policy is the most efficient with 12% of total floor space being non-leasable. Buildings under the two angular zoning policies are estimated to include 15% non-leasable space. These estimates account for core space as well as service space required for the building.

Revenue estimates have been differentiated by quality of space using three categories: prime, average and sub-average. Office rates were estimated at $23.00 per sq. ft. net for prime space and $20.00 and $17.00 per sq. ft. net for average and sub-average

space repectively. Retail net revenues per sq. ft. were estimated as $25.00, $20,00 and $15.00 for prime, average and sub-average space respectively. The current office market rates for prime, average and sub-average space are about $17.00, $15.00 and $12.00 respectively. This is felt to be a temporary situation and over the long-term, as the market firms up, rates are estimated to be close to the $23.00 or even $25.00 figure for prime office space.

The distribution of space on a quality factor is outlined in detail in Appendix B. Generally, the assumptions for retail space included prime space for footage along Sparks Street and Bank Street, average space for footage along the side streets (O'Connor and Metcalfe) and sub-average for Queen Street locations. Office space assignments on a quality basis assume that the majority of each of the buildings under the C2/8.0 option would be prime space. For buildings under the angular zoning policies prime space was assumed fronting on the Sparks Street Mall and the top floors of these buildings. The remainder was assumed to be average or sub-average space from a revenue standpoint.

The quality of space distributions are based on the development concept assumptions. These assumptions (12 foot floor to floor heights, floor size selections, etc.) were purposefully selected to ensure, where possible, prime space in each of the hypothetical developments. (In some cases, of course, prime space is not possible because of building configurations and locational characteristics.) Quality developments are assumed based on the location fronting on Sparks Street in the heart of the core area. These initial assumptions, therefore, will assist in the assessment of space quality from the perspective of potential tenants.

An implementation schedule of six years was assumed for each assembly option. The question of implementation is hypothetical given that the purpose of the study is to identify the relative

impacts of different zoning options. However, an implementation schedule does give a picture of the impact stream of the development in terms of demographic and fiscal impacts.

6.2.3 Fiscal Impact - Methodology

Fiscal impacts include direct and indirect costs to the City and revenues to the City. Direct costs are the creation costs to the City for the City portion of the development. The only direct cost to the City for redevelopment in the study area is associated with the elevated pedestrian system. All service connections, and associated sidewalk improvements are the responsibility of the developer. Indirect costs include municipal expenditures for general government which are directly attributable to the increases in commercial assessments and to foregone revenue. The City receives revenues in the form of property and business tax levies.

6.2.4 Fiscal Impacts - Assumptions

Fiscal impacts include changes in tax revenue and increased municipal expenses associated with the growth of commercial assessment. Tax revenues were estimated by first estimating assessment as a percentage of market value for each of the proposed developments. Then, to derive tax levies, the realty and business tax rates were applied, differentiated by assessments for prime and average space. Detailed assumptions concerning the amount of government occupancy and percentage factors for types of businesses are contained in Appendix B. For the purpose of analysis, blended assessment and tax rates were calculated (that is, the tax rates were estimated by weighting office and retail space and by weighting the percentage of government and private occupancies.

Increases in expenditures to the local government sector were estimated based on past relationships between commercial assessments and increased local government expenditures. For the

purpose of this analysis, the municipality is assumed to include both the City and the Region since they share in general government expenditures.

6.2.5 Demographic and Traffic Impacts - Methodology and Assumptions

The primary demographic impact of development in the two study blocks is the employment which is generated by the new, more intensity uses. Demographic impacts are calculated using an assumed density of employees per unit area for each different land use. Assumptions for office and retail space per employee were based on a sample of selected blocks in the immediate area which included new office and retail construction.

Finally, estimates are made of traffic generated by each development scenario in terms of the total number of person trips. These are then divided into transit and auto trips based on Ottawa trip generation and modal split characteristics.

6.2.6 Summary - Direct Impact

The assumptions used in the model represent a reasonable reflection of the Ottawa context for development of the types discussed and its associated impacts. For instance, the costs of construction take 1983 Ottawa labour contract estimates into account. The specifics of each assumption are based on judgement. Nevertheless, the critical factor in this analysis is that the assumptions for each of the options are identified so that the relative differences between options can be identified. For this reason as well, all costs and revenues are in 1983 constant dollars.

6.3 Retail Impacts

Retail trade on the mall is affected by changes in employment located in the two study blocks and changes in retail

attractiveness associated with both the redevelopment of the mall and changes in the amount of retail space. The analysis was conducted using the City of Ottawa retail trade analysis model (the SCOPE model) and was supplemented by information collected through a survey of pedestrians on the Sparks Street Mall. The survey is described in Appendix A.

6.4 Environmental Impacts

The analysis of environmental impacts includes a discussion of sunlight penetration, wind effects, and related impacts. This analysis was prepared using as background a review of the literature on pedestrian malls and in particular on behavioural studies associated with development adjacent to pedestrian malls.

7.0 DEVELOPMENT IMPACTS

7.1 Introduction

The methodology and assumptions used to estimate financial, fiscal, demographic, and traffic impacts were previously described in Chapter 6. This chapter describes the analysis results for direct impacts. The direct impact analysis was undertaken with the assistance of a computer model. The model output is reproduced in Appendix C for each zoning and assembly option. In addition impacts by interest group, an assessment of space quality and general economic impacts (tourism, employment, etc.) are discussed.

7.2 Residual Land Values

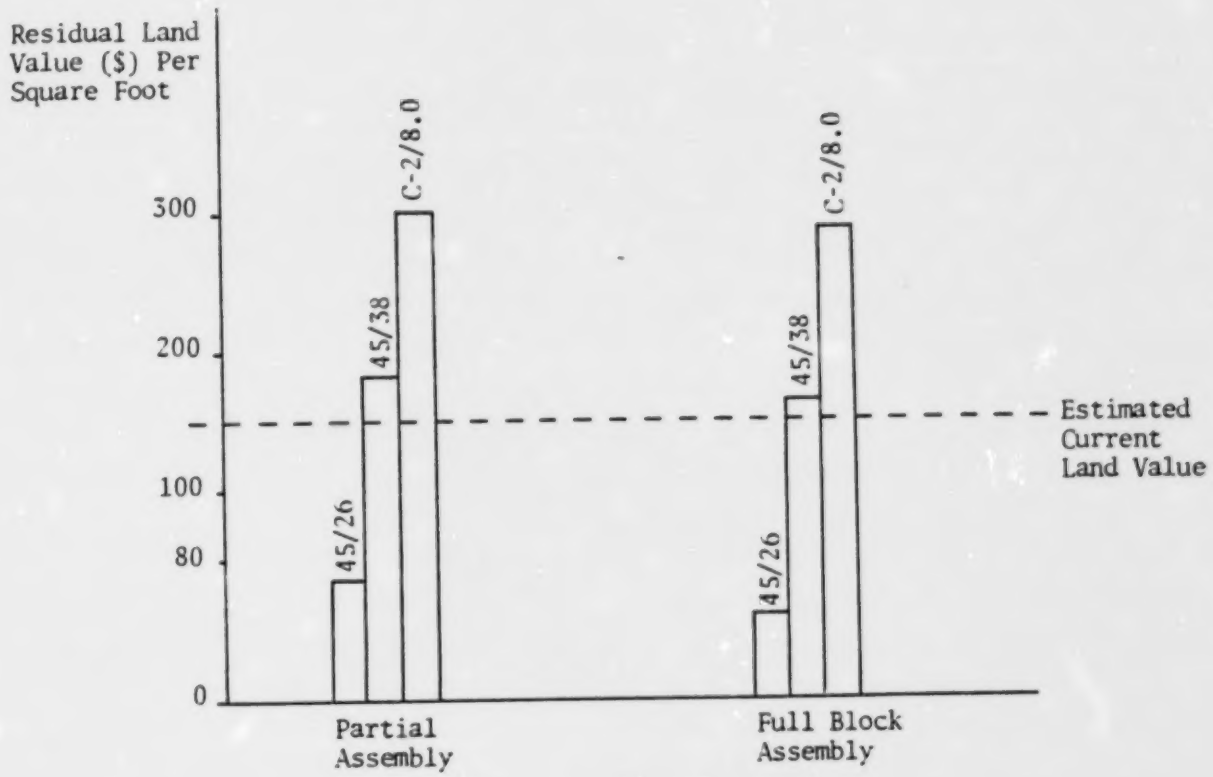
Exhibits 7.1 and 7.2 summarize the residual land values per sq. ft. by assembly option, parcel, and by zoning policy. The results generally indicate that the proposed zoning bylaw of 45 ft./26 degrees would reduce residual land values to about 25% of the land value calculated for the existing C2/8.0 bylaw, and the 45 ft./38 degree option results in a reduction to about 61% for the partial assembly option. In the case of a full block assembly, the reduction of residual land values based on the 45 ft./26 degree option amounts to about 19% of the existing bylaw values and the 45 ft./38 degree option is about 56% of the existing bylaw values. The chart in Exhibit 7.2 illustrates that the 45 feet/38 degree option approximates current land values and the C-2/8.0 option significantly exceeds current values.

Total residual land values are shown below indicating a difference from the 45 feet/26 degree option to the C-2/8.0 option of about $34.5 and $40 million for the partial and full block assembly options respectively.

EXHIBIT 7.1: RESIDUAL LAND VALUES PER SQUARE FOOT

ASSEMBLY OPTION/PARCEL		45 feet, 26 degrees	45 feet, 38 degrees	C-2/8.0
1. Partial Assembly				
Parcel -	1W	$99	$193	$338
	2W	48	175	285
	3W	59	170	297
	4W	35	85	210
	5W	168	282	344
	1E	68	190	303
	2E	66	158	285
Average (weighted by site Area)		74	183	301
2. Full Block Assembly				
Parcel - West Block		46	153	288
	1E	68	190	303
	2E	66	158	285
Average (weighted by site Area)		54	162	291

EXHIBIT 7.2: RESIDUAL LAND VALUES BY ASSEMBLY OPTION



Zoning Option	Total Residual Land Value ($000,000) Partial Assembly	Full Block Assembly
45 feet/26 degrees	11.329	9.368
45 feet/38 degrees	27.752	27.950
C-2/8.0	45.950	50.186

Estimates of residual land value loss relative to the highest value option (C-2/8.0; full block assembly) are indicated below.

Decrease in Residual Land Values ($000,000)

Bylaw Option	Full Block Assembly	% of Highest Value	Partial Assembly	% of Highest Value
C-2/8.0	0	(0)	- 4.236	(-8)
45 ft/38 degrees	-22.286	(-44)	-22.434	(-45)
45 ft/26 degrees	-40.818	(-81)	-38.857	(-77)

These estimates, of course, must be qualified by several factors. Firstly these are estimated residual land value decreases based on a maximum potential value. One could argue that the maximum value may never be realized given particular land assembly and market circumstances. Real land value decreases are also a function of the previous purchase situation (for example, land may have been written down long ago). Nevertheless, the land value decreases are indicative of the financial effect on the property owner and must, in the final analysis, be considered in the context of other factors relevant to an appropriate bylaw selection including impacts on the merchants, municipality and general economy of the City.

Given the current market rates for prime, average and sub-average office space revenues, it was decided to estimate residual land

values assuming lower revenues ($17.00, $15.00 and $13.00 per sq. ft. net revenues for prime, average and sub-average space respectively). These results are illustrated in Exhibit 7.3 for the partial assembly option. The residuals are reduced to negative amounts for all options except the C-2/8.0 at $22 per square foot, indicating in all cases that the partial assembly option development is uneconomic if current rental rates continue in the future.

EXHIBIT 7.3: RESIDUAL LAND VALUES ASSUMING CURRENT RENTAL RATES

Zoning Policy	Weighted Average Residual Land Values
45 feet/26 degrees	- $98
45 feet/38 degrees	- 40
C-2/8.0	+ 22

7.2.1 Potential Adjustments - Land and Parking Costs

The residual land value calculations do not assume a carrying cost for the land. Current market prices for land are about $150.00 per sq. ft. in the study blocks, although the estimated value of land for assessment purposes is closer to $200.00 per sq. ft. for Sparks Street frontage and about $180.00 per sq. ft. for Queen Street frontage. The lower land value figure reflects the current risk and difficulty in redevelopment.

For the purposes of illustration, if one assumes a two-year period for carrying land at the lower land value of $150.00 per sq. ft. at 14%, the cost of carrying the land would be about $40 per sq.ft. Under these general assumptions the residual land values would be decreased by $40 per sq.ft. in each scenario. Of course, the variety of possible land assembly situations is endless - some parcels will take longer to develop than others, some are already assembled and some could be developed by present

owners. The important point to be noted is that the residual land value must be adjusted downwards to reflect land carrying costs if development does not proceed immediately.

A parking allocation was not made in each of the developments. Parking is not required by the City and it was decided that the inclusion of parking would unduly complicate the task ot comparing the impacts of each zoning policy. Certainly, parking would be included in redevelopment of the larger sites to enhance marketability of the buildings. In the smaller sites, parking would not likely be provided given site constraints.

Costs of parking spaces are estimated to be quite high in the study blocks - about $60 per square foot for one level of parking and about $45 per square foot for 4 levels. Parking is usually a revenue producer but it would not cover actual costs in this case. Therefore, residual land values would decrease with the inclusion of this use.

7.2.2. Sensitivity Tests for Residual Land Values

In order to measure the sensitivity of residual land values to changes in key variables, a number of elasticities were calculated and these are presented in detail in Appendix C. These elasticities measure the change which would occur in residual land value given changes in construction costs, development costs, net factors, vacancy rates and revenues. The specific formula for elasticity is:

$$\text{Elasticity} = \frac{\text{residual land value change}}{\text{residual land value}} - \frac{\text{development factor change}}{\text{development factor}}$$

Exhibit 7.4 shows a summary of the changes in residual land values which would occur for three of these variables. This is calculated as follows:

% change in residual land value = elasticity x % change in development factor

Exhibit 7.5 illustrates the relationship in graph form for construction costs. As there is a linear relationship between variables, it becomes relatively simple to select different assumptions and determine the effect on residual land values. For instance, a $1.00 increase in construction costs would reduce the residual land value in the 45 ft./26 degree zoning option by 12.5% with lesser reductions for the remaining options. As may be expected, the residual land values are most sensitive to revenue assumptions, followed by construction costs and development costs. The lower gross floor areas of the 45 ft./26 degree option result in high elasticities for the three parameters reviewed, indicating that judgements about these are critical. As would be expected, the impact on residual land values decreases as the gross floor area increases.

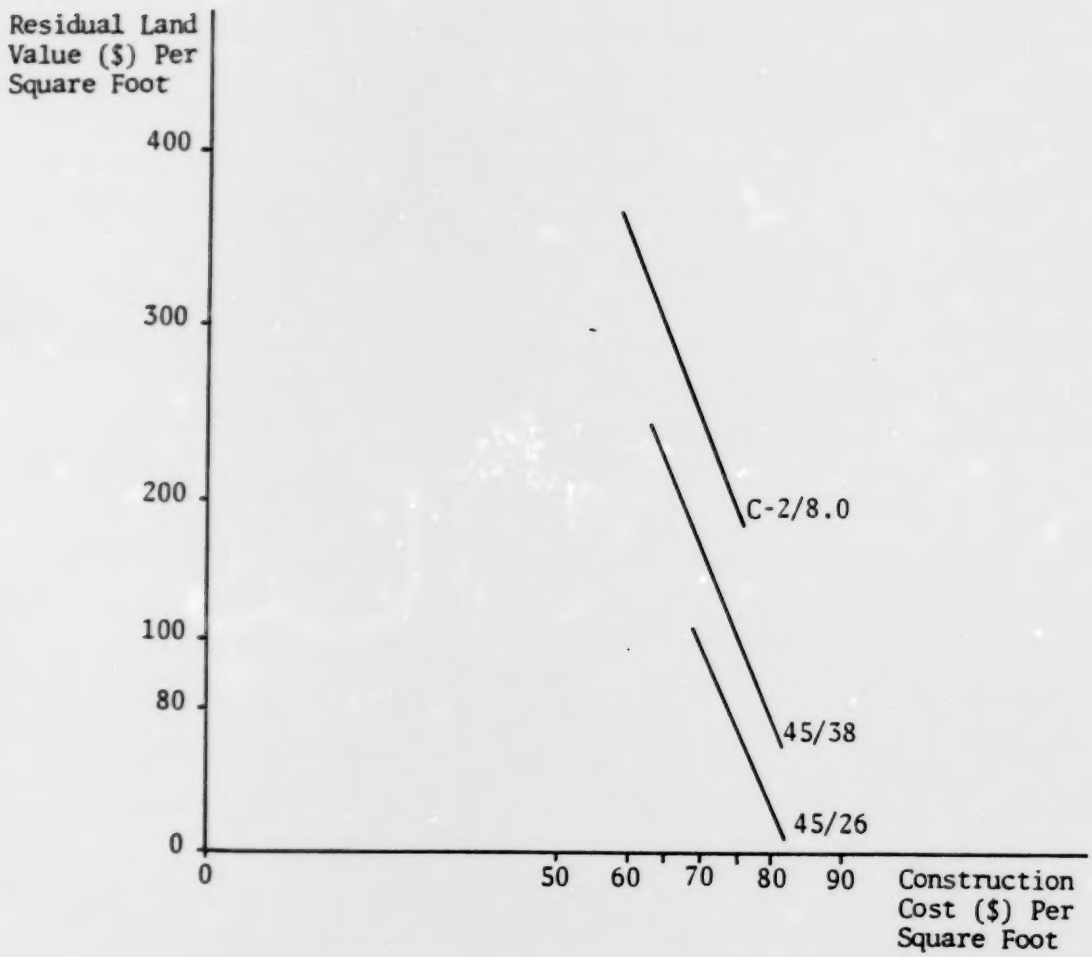
EXHIBIT 7.4: RESIDUAL LAND VALUE SENSITIVITY

Assembly Option/ Parameter	Residual Land Value Changes 45 foot/ 26 degrees	(%)	45 foot/ 38 degrees	(%)	C-2/ 8.0	(%)
1. Partial Assembly						
Construction Cost ($1.00 increase)	- $9.40	(13)	-$11.47	(6)	-$13.85	(5)
Development Cost (0.01 increase)	- 4.81	(7)	- 5.46	(3)	- 6.02	(2)
Revenues (5% decrease)	-39.22	(53)	- 49.14	(27)	- 60.20	(20)
2. Full Block Assembly						
Construction Cost ($1.00 increase	- 7.02	(13)	- 11.02	(7)	- 13.97	(5)
Development Cost (0.01 increase)	- 4.64	(9)	- 5.18	(3)	- 6.11	(2)
Revenues (5% decrease)	-36.22	(67)	- 46.98	(29)	- 61.11	(21)

7.2.3 Summary-Residual Land Values

The results indicate that with a change to the 45ft./26 degree zoning option the residual land value of most properties would be

EXHIBIT 7.5: RESIDUAL LAND VALUE SENSITIVITY TO CONSTRUCTION COST



significantly below the current market price of land in the two study blocks. Assuming that future developers would be considering the same types of building designs and occupancy and rental profiles as used in this study, the analysis suggests that for redevelopment to proceed under this bylaw, market prices would have to drop significantly. The C-2/8.0 option achieves the best financial performance and is economic under the assumptions used and accounting for land carrying and parking costs.

Under the 45ft./38degree zoning bylaw, residual land values would correspond roughly with current market prices. Under the existing C-2/8.0 zoning bylaw, residual land values are generally higher than current land market prices, suggesting that redevelopment potential is most attractive for this alternative.

There is a substantial variation between parcels in the residual land value results. Generally, site 4W fronting on Sparks Street is significantly below current market value under the angular zoning options whereas site 5W performs well. Site 5W fronts on Queen and Bank and does not extend through to Sparks. One can, therefore, achieve higher densities per sq. ft. of land on this site.

7.2.4 Renovation Options

7.2.4.1 Residual Land Value Estimates

In Chapter 5 it was noted that estimates of residual land values would be made for three sites, the Simpsons, Toronto-Dominion and Zellers properties, under an assumption of renovation instead of redevelopment. For these hypothetical renovations, reuse of the buildings for ground floor retail and office space was assumed. The renovation program was assumed to include replacement of mechanical and electrical systems, roofs, elevators, walls, ceilings and floor finishes, existing glazing, entrances, fittings and fixtures and thermal upgrading of exterior walls.

The gross floor space was assumed to remain constant and the renovation was assumed to result in high quality buildings.

Estimated renovation costs for the Toronto-Dominion, Simpsons and Zellers buildings were $50, $53 and $69 per sq.ft. respectively. To estimate residual land values, a weighted average net revenue per sq.ft. of $21.00 was used. Assumptions concerning other parameters were assumed to be equivalent to the redevelopment options described above except that (1) development costs were reduced to 40% of construction costs reflecting a reduction in the time period required for construction and approval periods, and (2) net leasable space was assumed to be 85% of gross space.

The analysis resulted in a residual land value per sq.ft. for the Simpsons building of $259, for the Toronto-Dominion Bank building of $209, and for the Zellers building of $65. These values do not include the cost of land or buildings. In the case of the Toronto-Dominion Bank building an assumption of current average revenues per sq.ft. of $18.00 suggests an economic value capitalized at 14% which is equivalent to $437 per sq.ft., significantly higher than the residual value after renovation. This suggests that renovation is not attractive if one assumes that the building would have to be purchased.

A similar assessment of the Simpsons building is more difficult because the building is not presently used for office or retail space. Thus one could argue that the economic value of the building is lower because there would be more preparation costs for reuse after renovation. For the sake of comparison, if one assumes an economic value based on a current average rental of $12.00 per sq.ft., the value per sq.ft. is $364, again higher than the residual after renovation.

The above analysis assumed average net revenues per square foot of $21. Heritage renovation, particularly on a Mall location, carries with it some prestige which can enhance revenue expectations. The residual land value is affected dramatically,

if one assumes a premium rate of $25 per sq.ft. based on a quality renovation, as the table below indicates.

Estimated Residual Land Values Per Sq.Ft.

Building	Renovation Cost/Sq.Ft.	Residual Land Value Assuming Per Sq.Ft. Revenues of: $21	$25
Toronto-Dominion	50	$209	$303
Simpsons	53	259	384
Zellers	69	65	123

In the case of the Simpsons building, the residual land value estimate with higher revenues approximates the estimated value per sq.ft. making the financial attractiveness of renovation more compelling.

7.2.4.2 Renovation/Redevelopment Options

The estimated renovation costs of about $50 per square foot for two of the buildings indicate that there could very well be financially attractive and exciting opportunities for combined renovation/redevelopment projects. Of course renovation costs for other buildings could be higher or lower depending on building condition and the renovation specifications. In a combined project there would be savings in total construction cost and yet achievable revenues may be the same or even greater than redevelopment given the potential prestige factor. In the absence of density level considerations, the only significant disadvantage anticipated could be in space inefficiencies attributable to the buildings structure and layout.

The table below indicates a range of impacts on residual land values by zoning policy options, assuming renovation costs of about $50 per sq.ft. and a fixed amount of renovation for each option. A weighted average construction cost was calculated

based on the percentage of the combined development that is occupied by the renovation portion. The percentage increases in residual land values are calculated by applying the elasticities calculated previously to the percentage change in the construction cost by option.

Renovation/Redevelopment Impact on Residual Land Value

Zoning Policy Option	% Renovation of Gross Floor Area	Construction Cost Change (%)	% Increase in Residual Land Value
45 ft./26 degrees	15	5	48
45 ft./38 degrees	14	5	22
C-2/8.0	11	3.4	10

The table indicates that the angular zoning options benefit most from a renovation component, given their smaller gross floor spaces per building. For instance, if the residual land value is $100 per sq.ft. for a redevelopment, then under the assumptions described above, it would increase to $148 per sq.ft. under the 45 ft./26 degree policy option. Where such an opportunity exists, the 45 ft./38 degree option would be considerably more attractive relative to current land values.

The location of heritage structures fronting on Sparks Street would enable combined renovation/redevelopment projects with redevelopment taking place at the rear of heritage buildings, along Queen Street. This is particularly significant in light of the City's proposed zoning policy structure with a height limitation on Sparks St. and a building envelope constrained by an angle beginning at the Sparks Street height. In fact the combination of the location of heritage buildings and the proposed zoning are complementary conditions under which heritage renovation could reasonably be encouraged. The advantages are:

. maintenance of reasonable financial returns given construction cost savings;

. creation of prestige retail and office space with a heritage flavour in the renovation portion;

. maintenance of interesting features of the development fabric along Sparks Street Mall; and

. development complementary to portions of the Mall's north side and capitalizing on the relationship to the historic Parliamentary area.

7.2.4.3 Summary - Renovation

In summary, the renovation options alone are not as financially attractive if one has to account for purchase of the building as part of the package. Of course it may be argued that existing owners, having already written down their buildings, could pursue a feasible renovation project. As well there may be business interests who would pay a premium for a Mall location, irrespective of the economics of renovation.

The renovation/redevelopment combination generally has considerably more potential financially, specifically for the angular zoning options. Pursuing a combined renovation/redevelopment project could improve the financial attractiveness of developments under these options. Certainly for the 45 ft./38 degree option it could result in a sound proposition in today's market.

7.3 Fiscal Impacts

Development under each of the proposed zoning bylaws would result in changes in the tax revenue situation for the municipality. Exhibit 7.6 illustrates the net taxation changes by zoning policy and by assembly option. As can be expected, if full development occurs under the C2/8.0 zoning policy it will create the greatest net taxation change for the municipality. The full block

EXHIBIT 7.6: ANNUAL MUNICIPAL NET TAXATION REVENUE

Zoning Policy	Assembly Options: Partial	Assembly Options: Full Block
1. 45 feet, 26 degrees	$ 810,400	$ 654,800
2. 45 feet, 38 degrees	1,280,400	1,200,100
3. C-2, 8.0	1,836,800	1,938,000

Note: (1) Includes realty and business taxes.
(2) Assumes completion of all development.

assembly option has lower net taxation changes for the angular zoning policy developments, attributable to the differential in prime versus average office space.

Exhibit 7.7 indicates municipal net benefits by zoning policy and assembly option. The net benefits account for foregone revenues from the development which existed before the hypothetical redevelopment, increases in municipal expenditures associated with increased commercial assessment, and the additional taxation generated by the hypothetical development. The potential difference in net revenues to the municipality after full development amounts to about $634000 - $793000/year for the 45/26 degree by law and $344000 - $456000/year for the 45ft/38 degree bylaw. The percentage declines in net benefits from the maximum achievable net benefits estimated are shown below.

	Assembly Options (% decline)	
Zoning Policy	Full Block	Partial
C-2/8.0	100%	- 3%
45 ft/38 degrees	-44	-36
45 ft/26 degrees	-76	-64

7.4 Demographic Impact

The hypothetical developments will generate increased employment on the Sparks Street Mall associated with changes in office and retail space. The factors used for average space per employee result in employment changes ranging from about 3000 for the 45 ft./26 zoning option to about 5000 for the C2-8.0 zoning policy. These employment changes have implications for retail sales on the Mall and these are discussed in some detail in section 8.0 of this report. Exhibit 7.8 illustrates the employment impact by zoning policy and assembly option.

EXHIBIT 7.7: ANNUAL MUNICIPAL NET FINANCIAL BENEFITS

Zoning Policy	Assembly Options: Partial	Assembly Options: Full Block
1. 45 feet, 26 degrees	$ 378,500	$ 250,700
2. 45 feet, 38 degrees	668,900	587,600
3. C-2, 8.0	1,012,700	1,043,500

Note: Net Benefits assume completion of all development.

EXHIBIT 7.8: DEMOGRAPHIC IMPACT - EMPLOYMENT

Zoning Policy	Assembly Option: Partial	Assembly Option: Full Block
1. 45 feet, 26 degrees		
New employment	3465	3711
Existing employment	569	696
Net Increase	2896	3015
2. 45 feet, 38 degrees		
New employment	4279	4626
Existing employment	569	696
Net Increase	3710	3930
3. C-2, 8.0		
New employment	5215	5865
Existing employment	569	696
Net Increase	4646	5169

7.5 Traffic Impacts

Estimates of the daily trips generated by the redevelopment are shown in Exhibit 7.9. In discussions with the Regional Municipality of Ottawa-Carleton it was felt that redevelopment of the two study blocks could be handled on adjacent streets from a traffic standpoint, with the primary loads located on Queen Street. There is now excellent transit service available on Queen Street and if future plans are realized for Albert Street to become a transit only street, Queen Street would then be available exclusively for auto traffic. Distributing the flow of auto and transit trips in this manner will increase the capacity of Queen Street. In any case the number of peak hour trips of the development alternatives is not sufficient to overload the present street system.

EXHIBIT 7.9: DAILY TRIPS GENERATED

Zoning Policy	Assembly Option: Partial — Transit Trips	Partial — Auto Trips	Full Block — Transit Trips	Full Block — Auto Trips
1. 45 feet, 26 degrees	5055	6443	5486	6992
2. 45 feet, 38 degrees	6204	7907	6778	8638
3. C-2/8.0	7525	9591	8525	10866

7.6 Distribution of Direct Impacts by Interest Group

To gain an understanding of the implications of the results from the perspective of those affected, an assessment was made of how these impacts would be distributed among the key interest groups.

Property Owners

The potential difference in property values (from current property values estimated at $150 per sq.ft.) to the property owners with the 45 ft./26 degree zoning policy is about $11.6

million dollars less for the partial assembly option and about $16.5 million dollars less for the full block assembly option. This estimate excludes consideration of land carrying costs for the developer. Estimated differences associated with the 45ft./38 degree option are significantly less as indicated in Exhibit 7.10.

EXHIBIT 7.10: MAXIMUM POTENTIAL VALUE DIFFERENCES TO PROPERTY OWNERS

	Assembly Option			
Zoning Policy Option	Partial	% of Current Value	Full Block	% of Current Value
Current Market Value Base (at $150 per sq.ft.)	$22.7 M	100	$25.9 M	100
45 ft/26 degree	- 11.6	- 51	- 16.5	- 64
45 ft/38 degree	+ 5.0	+ 22	+ 2	+ 8
C-2/8.0	+ 23	+100	+ 24.3	+ 94

These estimates also assume that the developments will take place immediately and this may in fact not be realistic. For instance, it is unlikely that land assembly is possible in the west block given the number of private property owners. Thus, the estimates of the property value decrease must be considered a maximum with actual differences of property value likely to be a lower figure given the qualifications on land carrying costs, parking and likelihood of redevelopment.

Municipality

Unlike the impact on property owners, the impact of the proposed by law on the municipality is much more complicated. Zoning is a practice which defines public rights to private property, and the municipality must weigh what it considers to be the benefits or disbenefits to all concerned, in arriving at a decision. Clearly, the magnitude of the potential differences in property value may be considered onerous for property owners in the blocks concerned. In addition, the municipality could potentially lose more than one half million dollars annually from the Mall in net revenues if it pursues the 45 ft./26 degree zoning option. These impacts, however, must be viewed in the context of the City's original objective which was to maintain the Sparks Street Mall as an active and enjoyable pedestrian space and retailing area. There are benefits, based on this stance for the City generally, for existing merchants and for the municipality which must be considered.

Under the assumptions used in the model, the maximum net revenue difference to the municipality from the Mall would be a reduction of about $650,000 per year. Again, this estimate must be adjusted downward by taking into account where the development would go if it did not go on the Mall. It is likely, even if less development occurs on the Mall, that the excess space which could not be accommodated there could probably be placed in other parts of the Ottawa Central area. Thus, the absolute revenue to the municipality will probably remain the same regardless of the extent of development controls on Sparks St.

Retailers

On the face of it, one could argue that full development under the C2/8.0 zoning option would diminish the importance of the Mall as both a desirable retailing area and as a tourist attraction. It can be argued that retail activity would be greater under the more restrictive zoning options and provide

more revenues to property owners through increased lease rates. To test the effects on residual land values, revenues of $30, $25 and $20 were used for prime, average and sub-average retail space respectively on the full block assembly option. With these assumptions the average residual land value for the 45 ft./26 degree option was increased by 24% to $94 per sq. ft. The 45 ft./38 degree option average residual land value increased about 9% to $199 per sq. ft. While raising residual land values, the difference does not bring land values under the 45 ft./26 degree zoning option to current market prices. In the case of the 45 ft./38 degree option the increased retail rents bring this option comfortably above current market price.

The judgement on the reasonableness of this sensitivity test must rest on the likelihood of achieving such retail lease rates. The degree to which retailing would be affected is discussed in more detail in Chapter 8 of this report, particularly as it relates to the relationship of employment-related retail effects. Arguably the highest density development option would result in a Mall which is less attractive than at present and therefore less enjoyable as a pedestrian route from which retail trade draws a portion of its business. Some argue that it would difficult to see the advantages of locating on the Mall as opposed to locating within a new development, for example on an interior space, which would have a more controlled environment. If indeed this is the case, then the City's objective is not met and retail merchants could suffer.

7.7 Space Quality

Chapters 5 and 6 described the development design assumptions affecting space quality. The land use assumptions included maximization of quality retail exposure, designs based on average floor space requirements for private sector office clients, and designs which minimized costly step-backs and small floor sizes where possible under the angular zoning options. The principle behind these assumptions was to attempt to ensure as much prime

office and retail space as possible. Thus the designs under the angular zoning policy options, for instance, included:

. limitations on building step-backs under the angular zoning policy options

. 12 foot floor to floor distances

. core area locations minimizing distances from cores to outside wall areas where possible

. retail street frontages with no public access from building interiors.

The C-2/8.0 zoning option generally enabled the highest percentage of prime office space from the perspective of potential tenants since this option allowed greater flexibility in floor size designs, window locations and core area locations. Having accepted the principle of retail access by the public only by street frontage, then retail space, adjusted for location considerations (on Sparks or Queen for example), is considered identical in quality in each of the three zoning options. If interior retail frontages were permitted then the angular zoning options (on through block sites) with atriums would be preferable to the C-2/8.0.

The design constraints imposed by certain of the partial assembly option sites will result in less than ideal space in all cases. On sites 4W and 3W, for example, windows would not be possible and/or recommended on the east and west building faces because of the potential that buildings on adjacent sites could block these views. Development on sites such as these is unlikely; rather developers would opt for larger sites through land assembly.

Building designs under the angular zoning options have the potential to offer interesting and unusual office accommodation

assuming the designs properly reflect as many of the elements of prime space requirements as possible. The advantage of a prestige location on or adjacent to Sparks Street Mall would, in our opinion, overcome the disadvantages of the angular zoning options for many tenants. While such designs would probably not work in the market place at other locations in the Core Area, they can be successful on Sparks Street.

A final consideration in space quality is the potential on selected sites for combined renovation/redevelopment projects. Given the increasing popularity of renovated space, there would be considerable prestige to be derived from a location on Sparks Street in a renovated building. This is a valuable commodity for some potential tenants enabling a premium on such space by developers.

7.8 General Economic Impacts

Direct impacts and their significance have been discussed from the perspective of each of the major interest groups. Development changes in the two study blocks will have additional effects which, though difficult to quantify, are nevertheless worthy of mention. These include effects on the Mall's role in the Capital Region generally, tourism, employment and incomes.

7.8.1 The Role of the Mall

The Sparks Street Mall fulfills a unique function in Ottawa's urban fabric. It provides a focus to the Central Area with its retail opportunities, concentration of financial institutions, location close to Parliament Hill, design sympathetic to the pedestrian, and space available for outdoor activities. As such the Mall is a nationally known feature of the City. When one thinks of Ottawa several images come to mind; Parliament Hill, the Rideau Canal, Sparks Street Mall and Byward Market among them. The significance of the Mall as an important element of Ottawa, the city, cannot be overlooked.

Therefore, the nature of development which the City permits in the study blocks must be considered in the context of potential impacts on the perception of the Mall by the residents in the Ottawa area and the visiting public. Just as there is an opportunity to enhance the current role and perception of the Mall through the type of development growth and change that is permitted, there is also the potential to diminish its importance. These perceptions can have significant effects on the Mall, particularly related to tourism.

7.8.2 Tourism

One area which relates in part to Mall retailing is the contribution of tourist dollars. The tourism context is complicated in terms of relating the continued attraction of the Sparks Street Mall to an appropriate zoning policy. The tourism business is presently estimated to have an annual value of about $350 million/per year for the region. The Sparks Street Mall is clearly one of the significant attractions for tourists visiting this area. If the micro-climate on the Mall diminished substantially through higher density development, then its attractiveness to the visitors would in turn be diminished. It has been estimated that about 18% of all tourist dollars are spent on retail goods. At a conservative estimate of 10% of those dollars spent on the Sparks Street Mall there is a potential loss of up to 6 million dollars annually. Assuming a six year redevelopment period and a twenty year building life cycle this would amount to a significant total potential loss to Mall retailers of about 80 million dollars.

7.8.3 Employment and Income Effects

It has been argued previously that there would be no direct financial impact on the City of restricting development in the study blocks since that development would take place elsewhere. Similiarly employment associated with new development would be located elsewhere. Thus there would be no effect on overall

employment in the Core area.

The only potentially significant effect on employment and incomes is that associated with retail trade. If retail trade is diminished by high density development and a corresponding reduction in the attractiveness of the Mall environment then the business of retailing will suffer through reduced sales per square foot. This in turn can act to reduce retail trade income and retail employment. Impacts on retail trade are discussed in detail in Chapter 8.

8.0 Retail Impacts

8.1 Introduction

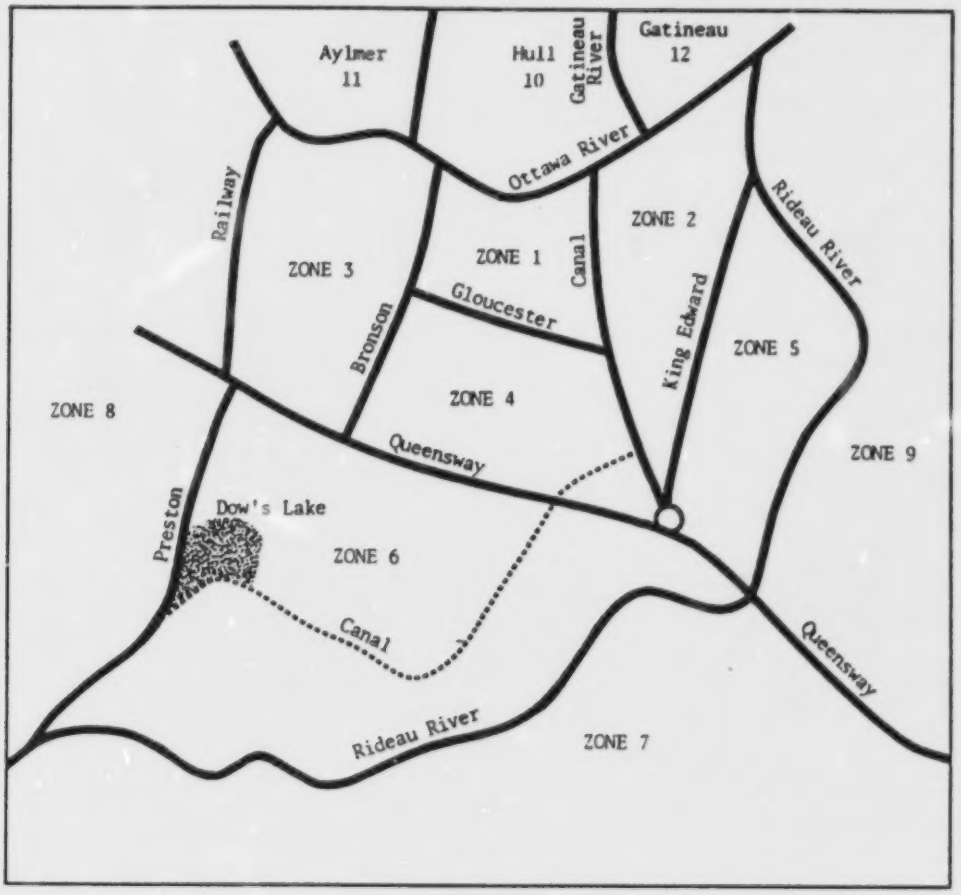
This chapter examines the implications of development under each of the zoning options for retail activity on the mall. The effects of increases in employment population and retail space through redevelopment are discussed. A pedestrian survey was undertaken to assist in the analysis of employment-related effects, and this chapter includes highlights from that survey. General information on respondent characteristics, visit frequencies, mode of transport to the Mall, purchases and reasons for visiting the Mall are contained in Appendix A.

8.2 Spatial And Employment Characteristics

For the purposes of the survey, the Region and the core area were each divided into zones to identify spatial variables (see Exhibit 8.1). The majority of Mall visitors were residents of the Ottawa/Hull region (83.5%), with 16.5% being visitors to the area. Employees within the region amounted to 70.4% of whom about 47% were Federal Government employees.

Two thirds of the respondents are employed in Zone 1 (the Ottawa core area) and of these about 50% are Federal employees (Exhibit 8.2).

EXHIBIT 8.1: SPARKS STREET SURVEY - ZONE AND BLOCK LOCATIONS



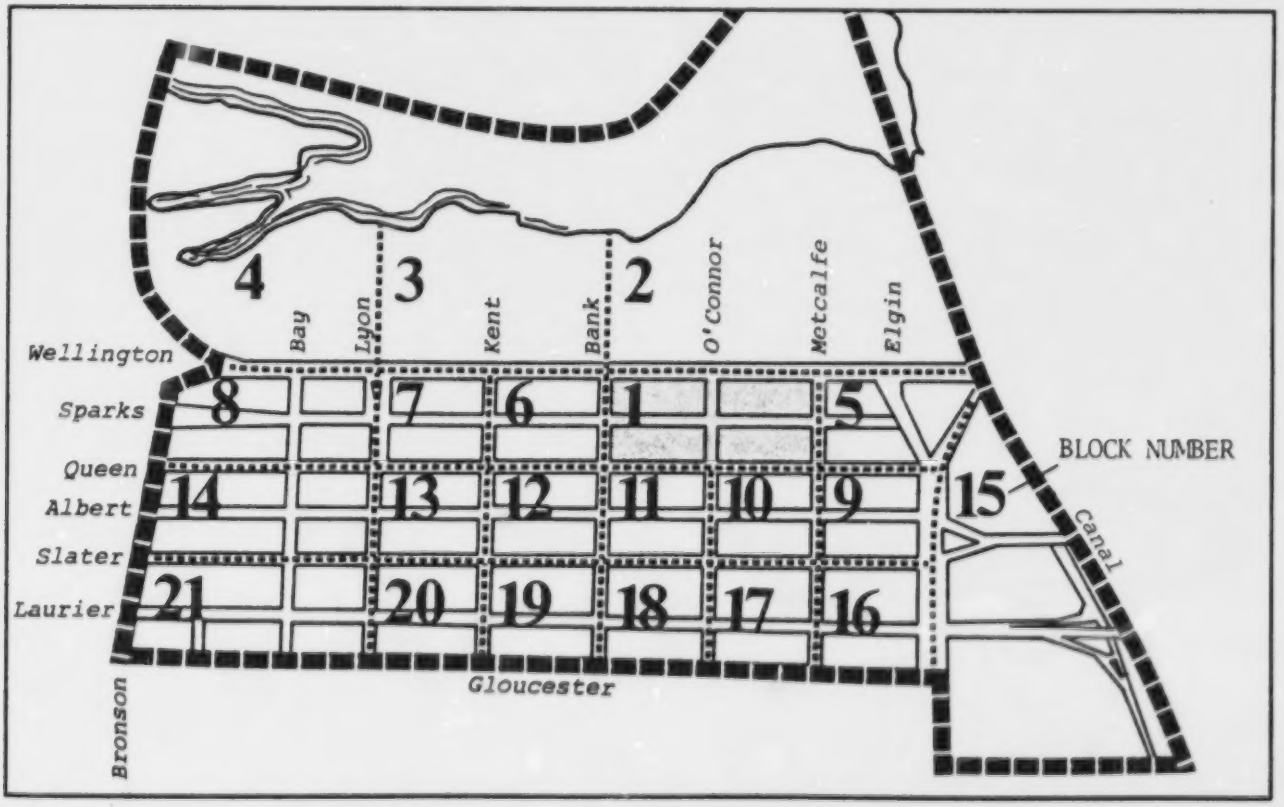


EXHIBIT 8.2: FEDERAL/NON FEDERAL EMPLOYEES BY ZONE

	Employees		
Area	% Fed. Empl.	% Non Fed. Empl.	% of Total Employees
Zone 1	32.34	33.21	65.55
All other areas	45.80	54.19	100

Of those employed in Zone 1,31% work in Block 1 (the four blocks fronting on Sparks between Bank and Metcalfe). Block 1 Federal employees constituted 40% of total Block 1 employees (Exhibit 8.3).

EXHIBIT 8.3: FEDERAL EMPLOYEES IN BLOCK 1 AND ZONE 1

Area	% Fed. Empl.	% Other	% of Total Employees
Block 1	12.46	19.11	31.57
Total Core (Zone 1)	49.3	50.69	100

The highest number of respondents live in Zones 13, 8 and 9 (17.2%, 15.8% and 11.8% respectively). Only 9.7% percent live in Zone 1, while 65.1% work in Zone 1 (Exhibits 8.4 and 8.5). Of these 57% are male and 42.8% are female.

Blocks 1 and 2 (those including the study blocks or closest to it) account for 41.6% of Zone 1 employees (Exhibit 8.6). Of the people working in Block 1, 60% were male and 40% female. In Block 2, 47% were male and 53% female. The distribution of the core area employment population surveyed is shown in Exhibit 8.7.

EXHIBIT 8.4: RESIDENTS BY ZONE

Zone	#	%
Zone 1	81	9.7
Zone 2	48	5.8
Zone 3	35	4.2
Zone 4	60	7.2
Zone 5	30	3.6
Zone 6	66	7.9
Zone 7	65	7.8
Zone 8	131	15.8
Zone 9	98	11.8
Zone 10	23	2.7
Zone 11	23	2.7
Zone 12	24	2.9
Zone 13	143	17.2
TOTAL	827	100.0

EXHIBIT 8.5: EMPLOYEES BY ZONE

Zone	#	%
Zone 1	379	65.1
Zone 2	42	7.2
Zone 3	13	2.2
Zone 4	20	3.4
Zone 5	1	.1
Zone 6	26	4.4
Zone 7	18	3.0
Zone 8	28	4.8
Zone 9	24	4.1
Zone 10	29	4.9
Zone 11	1	.1
Zone 12	1	.1
TOTAL	582	100.0

EXHIBIT 8.6: EMPLOYEES BY BLOCK IN ZONE 1

Block	% of Zonel Employees
Block 1	31.5
Block 2	10.1
Block 3	2.1
Block 4	2.1
Block 5	3.5
Block 6	6.3
Block 7	3.5
Block 8	2.1
Block 9	1.6
Block 10	5.4
Block 11	4.9
Block 12	5.4
Block 13	2.4
Block 14	1.3
Block 15	.5
Block 16	5.2
Block 17	4.1
Block 18	3.2
Block 19	2.7
Block 20	.5
Block 21	.2
TOTAL	100.0

In summary, employees constituted the largest proportion of those interviewed and almost 1/2 of the sample worked in the core area (Exhibit 8.8).

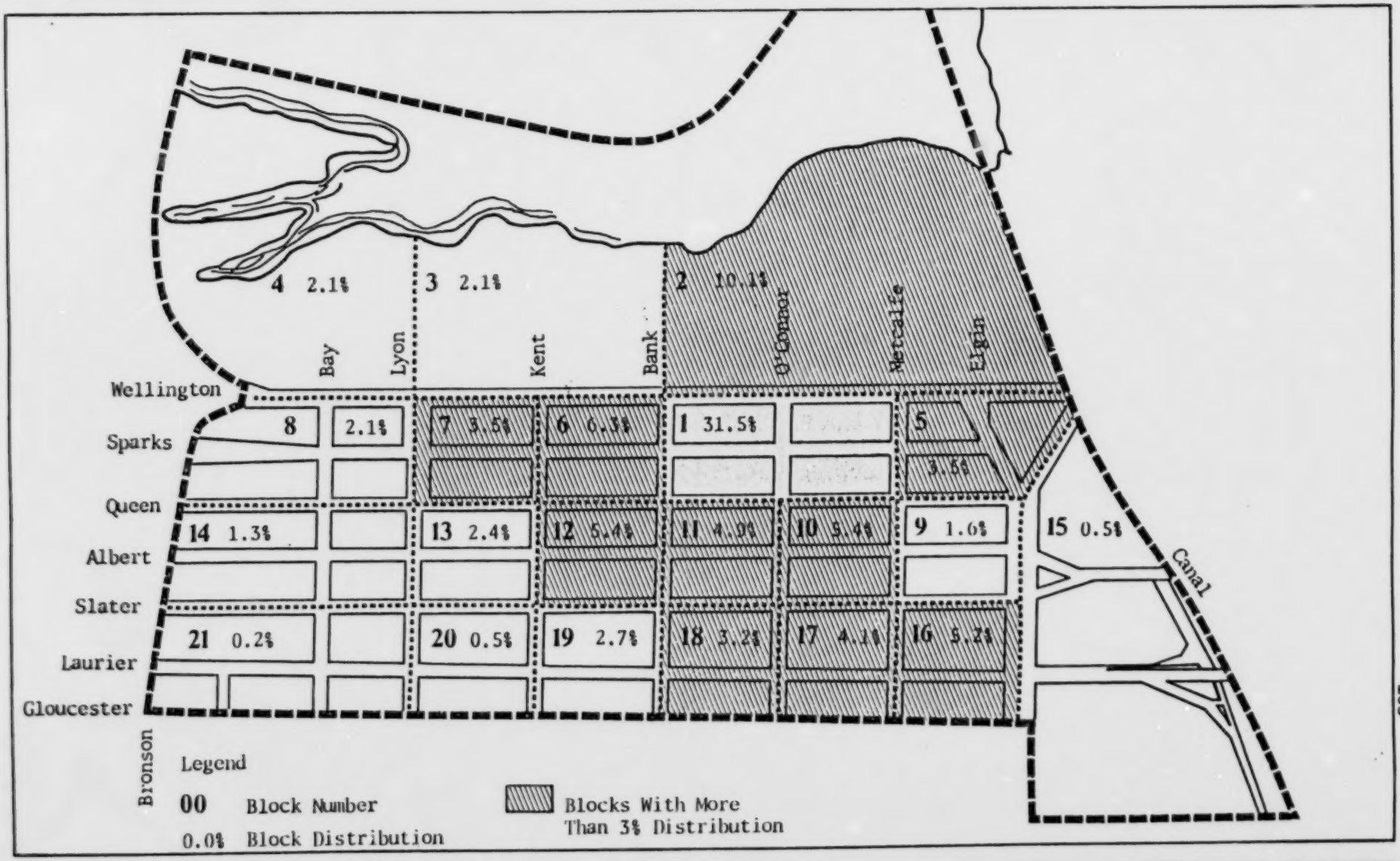
EXHIBIT 8.8: EMPLOYEE DISTRIBUTION

Area	Employees as % of Total sample	Employees as % of Total Employees sampled
Region	70.4	100
Zone 1 (Core Area)	44.3	65.3
Block 1 (within core area)	14	20

8.3 Implications for Retail Trade

The survey results described above illustrate that a high percentage of pedestrians on the Mall are employed in Ottawa's core area (44.3%). What is of interest in understanding the implications for retail trade is the contribution of core area employees and others located in the core area to retail trade on

EXHIBIT 8.7: CORE AREA EMPLOYMENT DISTRIBUTION BY BLOCK



the Mall itself. In order to derive a percentage of the total value of purchases by these employees, estimated values were calculated using an expected value technique. Respondents were asked to estimate the value of their purchases by goods type, and estimated values were calculated by applying the average value (for instance, a purchase which fell in the range of $6 - $15.00 was assumed to be valued at $10.00) to the number of purchases in that value category. Exhibit 8.9 indicates that core area employees accounted for 39% of the total estimated purchase value by all respondents and further, that employees working within Block 1 of the core area accounted for 11% of the total estimated purchase values.

EXHIBIT 8.9: ESTIMATED PURCHASE VALUE

AREA	Estimated Purchase Value
All areas	100%
Core Areas (Employees)	39%
Block 1 (within core area) (Employees)	11%

Distance from the study area was found to be an important factor in frequency of purchases. Exhibit 8.10 illustrates that 74% of the purchases were made by employees located within 2 blocks of the study area.

EXHIBIT 8.10: CORE AREA PURCHASE FREQUENCY

Block Distance from Study Area	Core Area Employees - Frequency of Purchases (%)	Core Area Employees Visiting Mall (%)
within 1 block	34	31.5
within 2 blocks	40	33.9
within 3-4 blocks	15.3	25.8
4 + blocks	10.7	4.8
	100	100

The distribution of purchase values of the total purchase value generated by core area employees follows this pattern. Almost 74% of the value of purchases generated by employees of the core area is by employees who work within 2 blocks of the study area (Exhibit 8.11). These figures are somewhat surprising when one considers that the number of blocks which are counted within 1 block of the study area are the four blocks on the north and south sides of the Mall between Bank and Metcalfe Street, whereas the number of blocks included as being within 2 blocks of the study area totals 13. In other words, 6.7% of the Core Area West employees generated 30.4% of the purchase value generated by all Core Area employees. Furthermore, about 29% of the total estimated purchase value from the entire sample is generated by employees within two blocks of the study area.

EXHIBIT 8.11: CORE AREA PURCHASE VALUE DISTRIBUTION

Block Distance from Study Area	% Estimated Purchase Value by Employees	% Distribution of Existing Employees
within 1 block	30.4%	6.7%
within 2 blocks	43.3	46.5
within 3 - 4 blocks	19.2	41.3
4 + blocks	7.1	5.5
	100.0	100.0

The information presented above indicates that local trade generated by downtown employees, at least during the interview period, is important to Sparks Street merchants. The majority of purchases by core area employees are generated by those working within two blocks of the study area. If redevelopment occurs in a manner similiar to that specified in this study, then it can be postulated that total retail sales should increase as well. Exhibit 8.12 illustrates the factor increase in employment by block distance from the Mall that would occur under the full block assembly option. (This option was chosen since it generates the maximum employment and therefore would represent the maximum impact.)

EXHIBIT 8.12: EMPLOYMENT INCREASE AS PERCENT OF CORE AREA EMPLOYMENT - FULL BLOCK OPTION

- Factor increase in employees (cumulative)

Area	45 feet/ 26 degrees	45 feet/ 38 degrees	C-2/8.0
within 1 Block	1.9	2.17	2.54
within 2 Blocks	1.11	1.15	1.2
within 3-4 Blocks	1.07	1.08	1.11
4+ Blocks	1.07	1.08	1.10

Employment through redevelopment of the study blocks would increase employment within 1 block of the study area by 90% to 154% for the 45 foot/26 degree and the C-2/8.0 zoning options respectively. Given that the purchase value generated by Block 1 employees is 11% of total purchases, then total retail sales can be expected to increase as shown in Exhibit 8.13.

EXHIBIT 8.13: POTENTIAL TOTAL RETAIL SALES INCREASE

Zoning Option	% Increase in Total Retail Sales
45 feet/26 degrees	9.9
45 feet/38 degrees	12.9
C-2/8.0	16.9

The potential increase could be higher or lower depending on two factors. First, increased attractiveness for shoppers through redevelopment could result in increased sales. This change in attractiveness may result from building design and more pleasant and modern space. For individual merchants, on the other hand, there could be a dampening influence on sales per square foot because of the addition, through redevelopment, of more retail space. The effects of these factors could be cancelled out if one assumes that they are about equal.

The figures indicate a potential difference of about 7% in total retail sales impact based on the zoning option selected. It must be stressed that seasonal information is not available for retail sales on the Mall and, therefore, this estimate must be considered overly sensitive to the employee effect. For instance, in the summer months one could logically assume that tourist purchases constitute a larger proportion of total retail sales. During the Christmas season employee generated sales could maintain their proportion of total sales, although information is not available to substantiate this proposition. In any case, local employment trade is an important contributor to retail sales and the differential between the extreme zoning options at about 7% is considered significant given the margin at which many retail outlets operate.

8.4 City - Wide Context

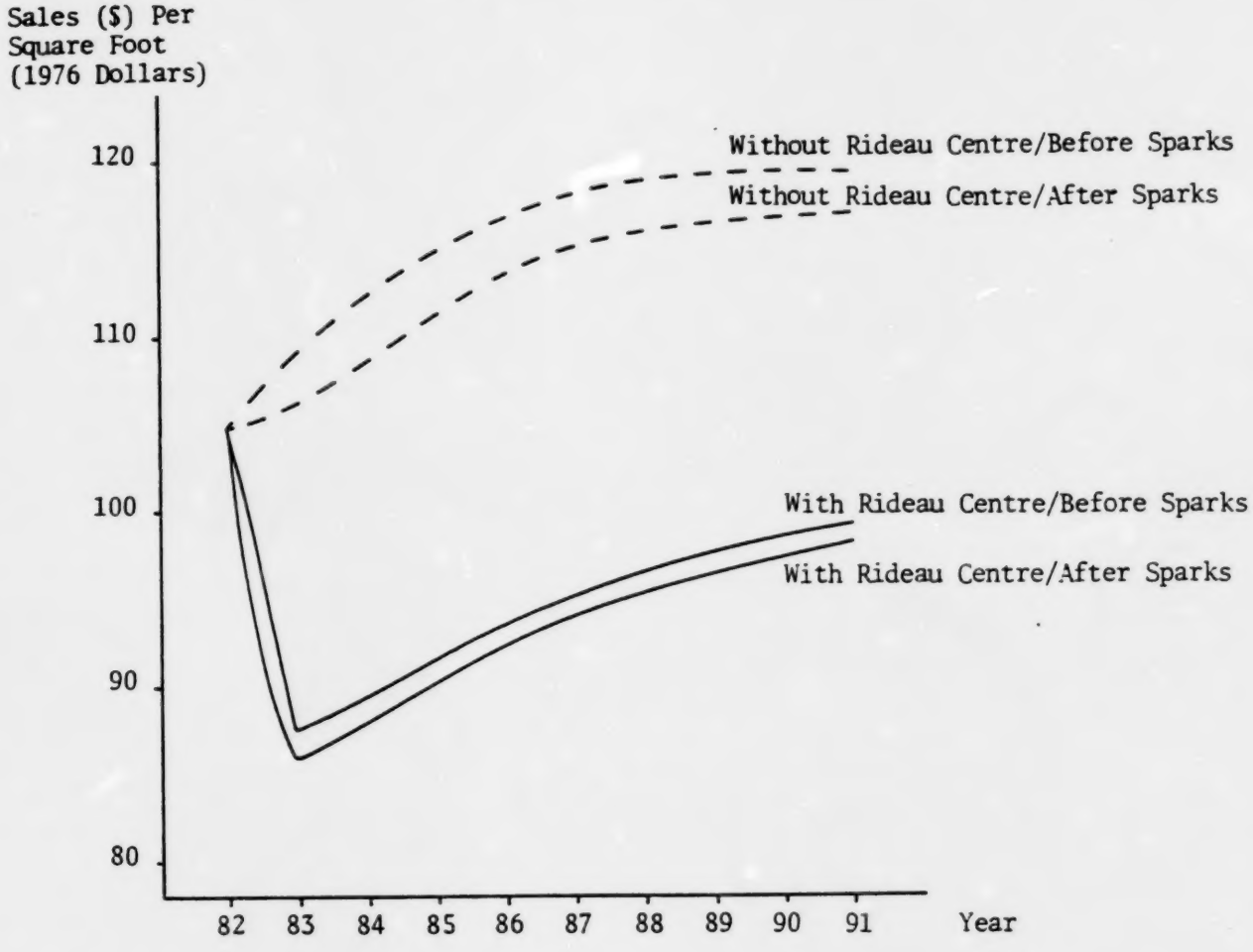
One of the key factors in retail sales is attractiveness to a shopping area associated with the amount of retail space in the shopping area. Generally, the greater the amount of space, the greater the attractiveness of the shopping area to potential shoppers. In this context Sparks Street retailers can expect to be affected in two possible ways; the first through an increase in retail space through redevelopment on Sparks Street itself and the second through the opening of Rideau Centre. In order to arrive at some estimate of potential impact from either of these factors an analysis was undertaken using the City of Ottawa's retail gravity model (the SCOPE model). Although the model is not calibrated to 1983 retail space distribution, it does enable estimation of the changes in retail sales per square foot which can potentially occur.

Two base cases were analysed with the amount of retail space on Sparks Street assumed to be unchanged with and without the Rideau Centre retail space included in the model. Then each of these was run again with the amount of Sparks Street retail space increased by about 100,000 sq.ft.

The results are shown in Exhibit 8.14 and illustrate that the Rideau Centre impact will be significantly greater than changes to Sparks Street itself. The decline in retail sales per square foot on Sparks Street (in 1976 dollars) is greatest in the first year, from $105.50 to $87.40 assuming no increase in retail floor space on Sparks Street. Adding retail space to the Mall makes a marginal difference, dropping the sales per square foot to $85.90.

Thus, the major concern for Sparks Street retailers arises from open competition from Rideau Centre. The effect of adding retail floor space to Sparks Street is marginal throughout the 9 year time period examined. This makes it all the more critical that development which is sensitive and complementary to the retail

EXHIBIT 8.14: IMPACTS ON SALES PER SQUARE FOOT OF RIDEAU CENTRE AND REDEVELOPMENT ON SPARKS STREET



function of Sparks Street be pursued.

8.5 Summary - Retail Impacts

Retail impacts from a retailer's point of view are felt in the change in retail sales per square foot. In this chapter employment effects, the effect of changes in the amount of retail space and the impact of Rideau Centre on Sparks Street Mall have all been discussed. Exhibit 8.15 summarizes retail sales per square foot estimates for in 1991.

The benchmark retail sales figures used for existing development are the retail sales estimates from the City of Ottawa model. The departure from existing development is the same for each of the zoning options; an addition of about 100,000 sq.ft. of retail space which results in higher retail sales. The employment effect estimate is based on the discussion in subsection 8.3 above. The quality/environment effect is a judgement of the effect of quality redevelopment balanced with sensitivity to the Mall environment. The effects of Rideau Centre are based on analysis using the City's retail model (see sub-section 8.4 above).

It is important to note that the absolute numbers are not as critical here as the changes attributable to the different factors. The C-2/8.0 option has the greatest positive impact, without Rideau Centre and with only the employment effect. Sales per square foot are not assumed to change for the 45ft./26 degree and 45 foot/38 degree options due to the quality/environment effect. The south side of the Mall is now predominately low-rise allowing for substantial sunlight penetration and a pedestrian scale. There is a potential negative environment effect from the C-2/8.0 option and this is accounted for by adjusting sales per sq.ft. downward by 10%. The option which performs best in terms of overall effect on retail trade is the 45ft./38 degree option.

EXHIBIT 8.15: ESTIMATED LONG TERM - RETAIL IMPACTS (1991)

WITHOUT RIDEAU CENTRE

ZONING OPTION[1]	SALES PER SQ.FT. RETAIL SALES PER SQ.FT.	ADJUSTED FOR EMPLOYMENT EFFECT	ADJUSTED FOR QUALITY/ ENVIRONMENT EFFECT	FINAL SALES PER SQ.FT.	WITH RIDEAU CENTRE FINAL SALES PER SQ.FT.
	(1)	(2)	(3)	(4)	(5)
Existing Development	$131.56	N.A	N.A	$131.56	$109.56
45ft./26 Degree	128.48	141.20	128.48	141.20	120.74
45ft./38 Degree	128.48	145.05	128.48	145.05	124.59
C-2/8.0	128.48	150.20	135.20	135.20	114.74

1. Retail sales estimated from City of Ottawa model. These are average retail figures for the core area and have been adjusted upward by 10% to account for existing high retail attractiveness and the Mall environment.

2. Employment effect estimated based on analysis in subsection 8.3.

3. It is assumed for the quality/environment effect that a pleasant Mall environment contributes about 10% to total retail sales. Given the potential for the C-2/8.0 option to negatively affect the Mall environment a 10% decrease is assumed for this option. This effect is already taken into account for the remaining options (see note 1 above).

4. The employment related and quality/environment effects are assumed to be absolute effects and are calculated accordingly when accounting for Rideau Centre impacts.

The greatest impact, however, is from Rideau Centre which reduces the retail sales per square foot, adjusted for employment and environmental effects, by approximately 14% to a level below the amount estimated before accounting for employment and quality/environment effects. This estimate is based on the retail square footage that is added to Central Area East, creating additional competition for available disposable income. More generally, the concentrated location and range of retail shopping opportunities will likely act as a disincentive to shoppers to move west of the Canal. The location of the Byward Market adjacent to Rideau Centre figures prominently here since it attracts a significant number of shoppers itself from all parts of the region. Finally, the shopping experience available in the Rideau Centre/Byward Market area is enhanced by the availability of an enormous variety of food and entertainment facilities, over 40 in number and located primarily in the Byward Market area. This adds a competitive edge which the Sparks Street Mall currently cannot match.

On the positive side Rideau Centre, with its hotel and convention centre, will add to the tourist and visitor population in the Core Area. These facilities should encourage some east/west pedestrian traffic due to the attractions of Parliament Hill and the Sparks Street Mall itself.

In summary Rideau Centre poses the greatest impact to Sparks Street merchants. The Rideau Canal/Confederation Square area will remain as a significant barrier and, in spite of some east/west pedestrian movement associated with the hotel and convention centre, the combined Rideau Centre/Byward Market facilities will likely be a disincentive to east to west shopping traffic. This underscores the importance of giving significant wieght to attractiveness factors in considering the future role of the Sparks Street Mall. If the Mall loses much of its current attractiveness then this can accelerate the decline of the retail competitiveness of the Mall and in turn negatively affect adjacent retail areas. As well, the City should seriously

consider the alternatives available to it from improving pedestrian access between Central Area East and West.

9.0 Environment Impacts

This chapter outlines the general effects of each of the zoning options on sunlight penetration and wind. A literature review of pedestrian Mall studies related to micro-climate was undertaken as part of this study and is summarized in this chapter.

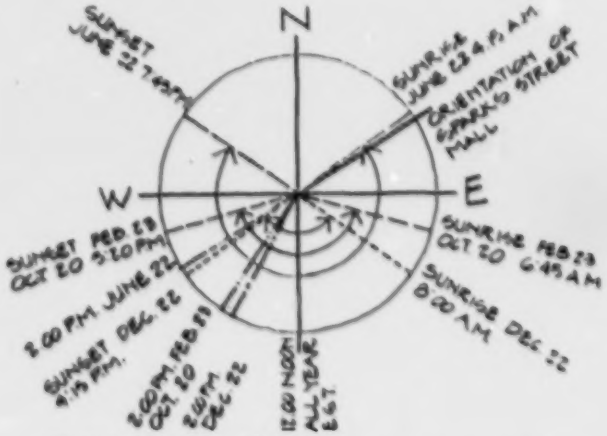
9.1 Sunlight Penetration And Shadow Patterns

Sunlight and shade play important roles in making the Sparks Street Mall an attractive environment for pedestrian activity, shopping or working. Sunlight is particularly desirable during the fall, winter and spring. Shade becomes essential during the warmer summer months. Using climatological data it is possible to make observations that will indicate the impact of the 45ft./26 degree, 45ft./38 degree or C-2/8.0 zoning options on the sunlight penetration and shadow patterns in the 'Mall volume' (that is, the air space defined by the Mall surface and fronting buildings) of Sparks Street. For the purpose of this analysis the width of the Sparks Street Mall is taken to be 60ft. (18.3m).

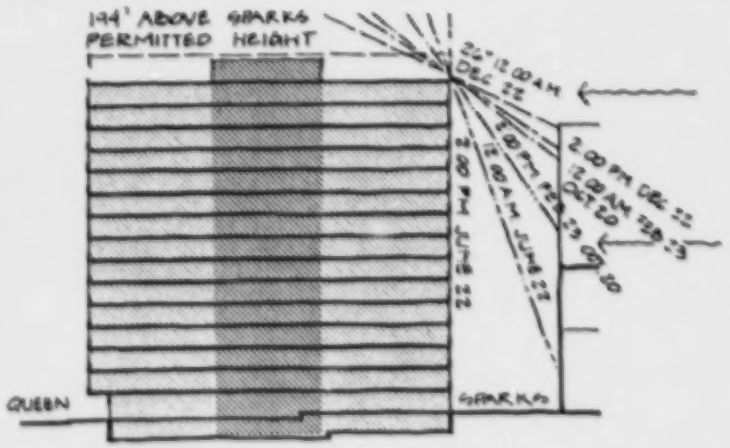
The 45ft./26 degree zoning option will allow the most sunlight to penetrate the Mall volume but may allow only slightly more sunlight to reach the surface of the Mall than does the 45ft./38 degree option. Exhibit 9.1 illustrates sun angles for each zoning option. On December 22 at noon for the 45ft./26 degree option, the sunlight falls approximately 16 ft. up the face of the buildings on the north side of the Mall. At 2:00 pm on December 22 the sun is approximately 5 ft. up this building face. While no sunlight reaches the surface of the Mall, the light reflected from the building face would brighten the street considerably.

On February 23 or October 20 at 12:00 noon the sunlight falls on 2 feet of the Mall surface, leaving 58 feet in shade. At 2:00 P.M. the same day the sunlight falls on approximately 28 feet of the Mall surface, leaving 32 feet in shade. This is virtually the same as for the 45ft./38 degree zoning option.

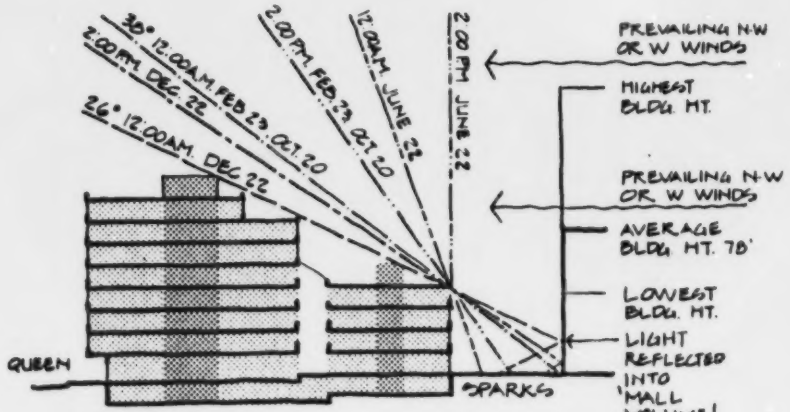
EXHIBIT 9.1: SUN ANGLES BY ZONING POLICY OPTION


N
W
E
SUNSET JUNE 22 7:45 PM
SUNRISE JUNE 22 4:15 AM
ORIENTATION OF SPARKS STREET MALL
SUNSET FEB 23 OCT 20 5:10 PM
2:00 PM JUNE 22
SUNSET DEC 22 4:15 PM
2:00 PM FEB 23 OCT 20
2:00 PM DEC 22
12:00 NOON ALL YEAR E.S.T.
SUNRISE FEB 23 OCT 20 6:45 AM
SUNRISE DEC 22 8:00 AM

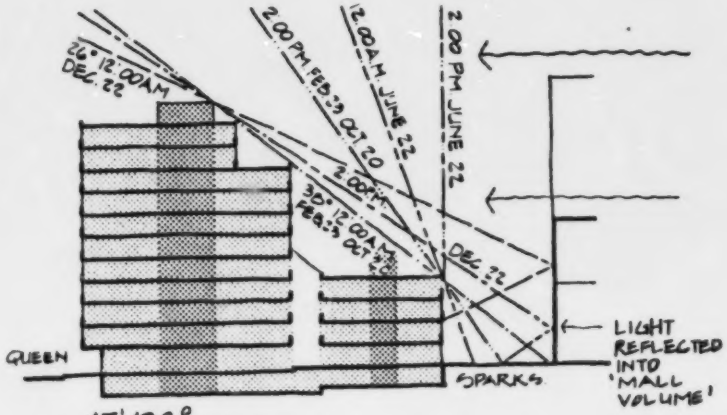
SUN ANGLES IN PLAN (AZIMUTH)


194' ABOVE SPARKS PERMITTED HEIGHT
26° 12:00 AM DEC 22
2:00 PM JUNE 22
2:00 PM DEC 22
12:00 AM FEB 23 OCT 20
2:00 PM FEB 23 OCT 20
12:00 AM JUNE 22
QUEEN
SPARKS

C-2/80 SECTION


30° 12:00 AM FEB 23 OCT 20
2:00 PM DEC 22
26° 12:00 AM DEC 22
2:00 PM FEB 23 OCT 20
12:00 AM JUNE 22
2:00 PM JUNE 22
PREVAILING N-W OR W WINDS
HIGHEST BLDG. HT.
PREVAILING N-W OR W WINDS
AVERAGE BLDG. HT. 78'
LOWEST BLDG. HT.
LIGHT REFLECTED INTO 'MALL VOLUME'
QUEEN
SPARKS

45'/26° SECTION


26° 12:00 AM DEC 22
2:00 PM FEB 23 OCT 20
12:00 AM JUNE 22
2:00 PM JUNE 22
30° 12:00 AM FEB 23 OCT 20
2:00 PM DEC 22
LIGHT REFLECTED INTO 'MALL VOLUME'
QUEEN
SPARKS

45'/38° SECTION

SUNLIGHT PENETRATION & SHADOW PATTERNS EASTERN STANDARD TIME 45'/26', 45'/38', C-2/80 0 10' 50 100

For the 45ft./38 degree zoning option on December 21 at 12:00 noon the sunlight would fall approximately 52 1/2 feet up the face of the buildings on the north side of the Mall. At 2:00 pm the sunlight would be 18 feet up this building face allowing considerable light to be reflected into the Mall. The amount of sunlight reaching the Mall volume from February 23 to October 20 (8 months) will be virtually identical to that for the 45ft./26 degree zoning because the determining factor, common to both options, becomes the 45 feet height limitation as the sun rises above 38 degrees. (Only a negligible difference would be possible if 12 foot floor to floor heights are used as the fourth storey of the 45ft./26 degree option may be set back slightly further from Sparks Street than for the 45ft./38 degree option). So, both options will provide the same excellent sunlight conditions throughout the majority of the year.

For both of these options on June 21 at 12:00 noon the sunlight will cover approximately 44 ft. of the Mall surface leaving only 16 feet in shade. At 2:00 P.M. on June 21 the sunlight will cover all 60 feet of the Mall surface width as the azimuth angle of the sun lines up directly with the bearing of Sparks Street and the sun shines down the length of the Mall. This 2:00 P.M. June 21 condition clearly applies to all three zoning options. During these times shade provided by trees, arcades, umbrellas or other built elements will be required.

The only substantial difference between the 45ft./26 degree and 45ft./38 degree options is the amount of sunlight that is reflected into the Mall volume from the building faces on the north side of the street between October 20 and February 23 (4 months). It should be noted that the percentage of sunlight hours per day is generally much less in the winter months when a greater number of days are overcast. This, in combination with colder temperatures from October to February, may necessitate the use of devices such as arcades and/or radiant heating to improve the pedestrian experience on the Mall.

The C-2/8.0 zoning option allows buildings to be built up to a height of 194 feet on the south side of the Mall. Buildings of this height would allow no sunlight to reach the Mall surface at noon on any day during the year. Only afternoon sun during the summer could be guaranteed under this option. While it may be unlikely that all buildings contructed under this zoning option would be built to the full 194 feet height, the possible environmental impacts could be extremely severe.

9.1.1 Effects On Queen Street And Suntraps

In order to maximize development under the 45ft./26 degree or 45ft./38 degree options the building heights along Queen Street would probably be between 8 and 12 stories. Because these buildings are on the north side of Queen they would tend to reflect light onto the street. One possible impact would be the shading of late afternoon sunlight from Queen Street in the mid summer months. This is not a serious condition and may be an advantage on hot days.

Because of the maximization of the built form along the Queen Street frontage, any setbacks provided along Sparks Street would not substantially increase the sun penetration to the Mall during the critical mid winter months. In order to create a 'sun trap' it would be necessary to lower the height of the building envelope (for example; to 25ft./26 degree, where 25 ft. = 2 stories). At noon on December 21 this would allow approximately 11 feet of sunlight on the Mall surface. However, Sparks Street is approximately 32 degrees north of the true east-west orientation (which is perpendicular to the angle of the sun at noon). This would restrict the amount of sunlight in any sun trap by shadows cast from adjacent buildings. Sun traps would thus be severely limited in value and development potential would be rendered uneconomical. Therefore it is desirable that the street line of built form be maintained and that one zoning option be applied to the entire block. In this way the retail character of the street is preserved and the Mall itself remains

the centre and focus of pedestrian activity.

9.2 Wind Effects

Winds can both add to and detract from the environment of the Sparks Street Mall. At best, gentle summer breezes can provide cooling relief from heat, while causing flags or banners to unfurl against the sky. Light winds and breezes bring fresh air to replace exhaust fumes and other airborne pollutants. At worst, strong gales and gusts of wind can make pedestrian movement difficult, raising dust or debris from the street surface or breaking branches from trees and hurling them into people or buildings.

Of all the climatological factors affecting the city street, wind is probably the most difficult to analyze. In order to make definitive conclusions about its effects on Sparks Street and the three zoning options under investigation, it would be necessary to perform wind tunnel tests. From a review of current literature and case studies, it is possible to make general observations pertaining to the 45ft./26 degree, 45ft./38 degree and C-2/8.0 zoning options and their effects on wind patterns in the Mall.

The prevailing winds in Ottawa tend to be from the north-west, the west or the east. The Mall is oriented 32 degrees north of true east and so is not aligned with most of the prevailing winds (Sparks Street would be approximately perpendicular to a norht-west wind). Generally some sheltering effect can be expected in the middle of each block from north-west or west winds with turbulence generated at intersections and higher buildings. Tall buildings and rectangular street grids generally exaggerate wind movements. Buildings that protrude substantially above the mean building height tend to obstruct the prevailing winds which move at higher speeds over 30 ft. above grade. Portions of these winds are deflected downwards by the buildings to the streets causing vortex or venturi effects. Corners or

narrow spaces between tall buildings can cause additional acceleration of wind and focus wind currents.

The directions of winds, size and orientation of buildings are key factors in understanding wind movements at street level. It has been observed that taller buildings along Sparks Street can cause ambient wind speeds to increase by 25% at street level. Similarly where high buildings face one another on either side of the Mall, as between Bank and Kent Streets, undesirable wind speeds and movement patterns occur. (Wind Study City of Ottawa Planning Branch, September 1977.)

The 45ft./26 degree and 45ft./38 degree zoning options tend to produce a building consisting of a 4 story portion directly along Sparks Street and an 8 - 12 storey portion along Queen Street. These zoning options would tend to produce relatively even building heights along the street from property to property as various owners attempt to maximize their development potential. The 45 ft. height is in keeping with the existing low scale of buildings on the south-east side of Sparks. The effects on winds on Sparks Street would probably not vary substantially between these two alternatives and the all over result would be one of moderation.

The low 45 ft. height of buildings along the south side of Sparks Street would prevent prevailing north-west or west winds coming over the higher (78 ft. average height) buildings on the north side of the street from being deflected downwards into the Mall. Winds flowing into higher portions of the building towards Queen Street would be deflected downwards onto the 4 story portion before reaching the Mall. The relatively uniform heights would reduce additional turbulence due to winds flowing along Sparks Street normally caused by large variations in building heights.

Some higher wind speeds may be anticipated on the Queen Street face of the buildings from east winds. The effects of these winds may be offset by use of arcades, canopies, or by setting back upper stories of the buildings on small 'podiums'. The buildings should provide shelter from north-west or west winds.

The C-2/8.0 zoning could produce 15 or 16 storey buildings on either Sparks Street, Queen Street or both. This zoning option could also result in building patterns with large discrepancies in heights, setbacks and building massing. These differences would tend to disturb natural wind patterns causing acceleration and down drafts. Under this option, serious wind problems could be created at the surface of the Mall.

Street intersections frequently cause unique wind conditions due to the converging openness of the streets from different directions. Frequent variation in building heights at the various corners of the intersection also affects the behaviour of the winds. The proposed 45 foot height limit on Sparks Street would not likely create any additional wind problems at the intersections but may allow desirable breezes to reach the Mall during the summer. Some problems may still occur due to existing high buildings at intersections.

The 45ft./26 degree and 45ft./38 degree zoning options will result in medium rise building heights at the Queen Street intersections and higher wind speeds may result. Pedestrians may be sheltered from any down drafts with the use of arcades, canopies or podiums.

The 15 or 16 story heights of the C-2/8.0 zoning option could result in far more serious wind problems at intersections. Wind tunnel testing would ideally be mandatory for these developments. There are examples of serious wind problems on the Mall such as the one at the corner of Sparks Street and O'Connor caused in part by an existing 13 story building. The occasional strong winds at this intersection tend to make the pedestrian experience

on the Mall discontinuous, separating one block from another. In addition to the careful design of new buildings, remedial action may be required in such cases. The installation of glazed wind screens on the Mall surface (a device employed successfully in other situations) or the partial enclosure of the Mall and/or side street with a free-standing open air glazed roof are two of many design elements that could prove helpful.

9.3 Summary of Literature Search

To supplement the assessment of Mall micro-climate conditions related to development a literature search was undertaken. The results are summarized below.

Several reference libraries and data bases were searched for references to pedestrian malls. A clear distinction between a mall and shopping centre is rarely evident in the literature. Most articles have been written on enclosed shopping centres rather than downtown outdoor malls. The few articles that have been published on outdoor malls refer mostly to their establishment in terms of community participation, decision making processes, traffic diversion and very general features rather than their operating characteristics, behavioral needs/responses of people or micro-climate/environment.

Key words used to guide the search of library data bases were by field:

(a) Pedestrian Shopping Traffic-free zone
(b) Open space urban shopping-malls
(c) Planning environment behavior micro-climate

The data bases searched included:

. Transport Canada Central Library

. Department of Transport National Library

- National Library and Archives
- Canada Institute for Scientific and Technical Information
- Intergovernmental Committee on Urban and Regional Research
- Univet, Dataline, Environline and Dialog

Four computer based reference catalogues were reviewed including all references published by (or including research supported by) all the Departments and Agencies of the U.S.; all of the theses from Canada and the U.S.; all of the articles in the journals and books held in the Library of Congress and the National Archives of Canada and all affiliated libraries across Canada; and the data bases of several major private organizations such as the Land Corporation. Results were disappointing. For example, of nearly 15,000 articles on Urban issues in the Dialog network, 2,700 include pedestrian references but only 13 articles include pedestrian and traffic free zones; 7 include pedestrian and open space; 4 include environment; 0 include micro-climate. Similar results were obtained from the other computerized data-bases that were searched.

Key relevant references are annotated in Appendix D. These references have been carefully selected but even so, very few address the specific issues of: micro-climate, environment, behavioral, response and mall improvement.

Only three messages are clear:

- Malls provide dynamic activity spaces, the full benefit of which can only be realized if malls are upgraded as needs/expectations change.
- To be successful malls must be attractive, of good design and of high quality materials.

. Malls must be considered in the total context of the downtown area as well as the entire region which they serve. They must provide a distinctive alternative to other shopping areas.

10.0 OBSERVATIONS AND CONCLUSIONS

10.1 Role of the Sparks Street Mall

The objectives which the City selects for the Sparks Street Mall are important in determining the appropriate zoning policy to pursue. In Chapter 4 of this report several possible roles were identified based on discussions with merchants, land owners and City and government agencies. These roles are shown in Exhibit 10.1 along with commentary concerning the degree to which the three zoning policy options as reviewed throughout this report would be supportive or otherwise of these objectives. The judgements made about the degree to which any of the zoning policy options support the possible futures for the Sparks Street Mall are based on assessments taking into account financial, fiscal and environmental impacts.

Pursuing an objective of creating a financial and office district with little emphasis on retail (role 2) or an objective allowing for change according to market forces (role 5) can be consistent with a C2/8.0 zoning policy. In these objectives, highest density use within the constraints of the parliament height limit are seen as appropriate. Concern for the nature of the pedestrian environment on the Mall would be given low priority in these cases.

The Mall as an urban open space with retail and entertainment linkages would be most supported by the 45 ft./26 degree zoning option wherein buildings are kept at the lowest scale possible to ensure that the urban open space features are maximized. It was pointed out (Chapter 9) that there is a marginal difference in environmental effects between the 45ft./26 degree and 45ft./38 degree zoning option. Thus, the latter option may be said to be supportive of this role. Full development of the C2/8.0 option will seriously jeopardize the Mall as a comfortable pedestrian environment.

The Sparks Street Mall as a major shopping area with restaurants

EXHIBIT 10.1: ROLE/ZONING POLICY RELATIONSHIP

Role	45'/26 degrees	45'/38 degrees	C2/8.0
1. Quality retail and more entertainment	not sufficiently supportive of retail given limits on potential employment increase	most supportive	too many negative environmental effects
2. Financial and office district (tourist-oriented retail/ entertainment)	too restrictive	somewhat restrictive	most supportive
3. Financial and office district with quality retail	too restrictive, not sufficiently supportive of retail given limits on potential employment increase	most supportive	too many negative environmental effects
4. Major shopping area with restaurants, entertainment	too restrictive	supportive	supportive
5. Change according to market forces - no government intervention	too restrictive	too restrictive	most supportive
6. Distinct financial/ high quality retail area with strong association with location adjacent to Parliament Hill	too restrictive, not sufficiently supportive of retail given limits on potential employment increase	most supportive	too many negative environmental effects
7. Urban open space area with retail/ entertainment	supportive	supportive	not supportive

and entertainment facilities could lead to either a 45 ft./38 degree zoning policy option or the C2/8.0 option. In the case of the C2/8.0 option, maximum employment density would be obtained and one could envision a covered Mall as well as substantial retail space in the interior of new buildings in much the same way as 240 Sparks is presently configured.

The remaining roles identified as possibilities for the Sparks Street Mall (roles 1, 3 and 6) would require a zoning policy similar to the 45 ft./38 degree option. In this case a balance is obtained between density of employment and a comfortable and attractive pedestrian environment. Less density, as in the 45 ft./26 degree option, would discourage quality developments and would not be of maximum support to Mall retail trade. The highest density C2/8.0 option would diminish the quality of the pedestrian environment to an extent that is not supportive of the retail and restaurant/entertainment activities in an open pedestrian mall setting. Indeed, the current ambience and activity of the Sparks Street Mall as a pleasant open shopping area would be lost if full development potential is exercised under the C-2/8.0 option.

The City has proposed a 45 ft./26 degree zoning policy option for the south side of the Sparks Street Mall between Bank and Metcalfe Streets. Based on the preceding analysis,this option is only appropriate for an objective for Sparks Street Mall as a quality open urban space related to retail and entertainment facilities. Indeed, the 45ft/26 degree option is likely to discourage all but the most limited redevelopment. There are, however, a number of other possible futures for the Sparks Street Mall (as discussed above), and consideration of any zoning option must be made in the context of a decision on the future of the Mall and its function as an urban area within the City of Ottawa. The discussion above is offered to assist the City in its decision-making.

10.2 Summary of Findings

The study has addressed several issues related to the future of the Sparks Street Mall and the potential impacts of various zoning policy options. Exhibit 10.2 illustrates the impacts identified in summary form by interest group.

10.2.1 Summary-High Density Versus Restricted Density Development

One of the key questions in this study is the set of tradeoffs that must be considered in either allowing high-density development (the C-2/8.0 zoning option) or restricting the density of development (the 45 feet/26 degree, 45 feet/38 degree and similar options).

Exhibit 10.3 summarizes our findings expressed as tradeoffs which the City should consider in the course of determining the appropriate development control policy. As a general matter permitting the highest density development (C-2/8.0) favours property owners through potential for retaining and/or enhancing property values. It also enhances the City's fiscal position although revenues from the development would be achieved in any case from other locations. These advantages must be weighed against the disadvantages associated with a reduction in the quality of the Mall environment.

The restricted density alternative does not favour the property owner. On the other hand the maintenance and enhancement of the Mall environment has advantages in supporting retail activity and maintaining the character of the Mall as an active, enjoyable pedestrian area and tourist attraction.

EXHIBIT 10.2: SUMMARY OF IMPACTS

INTEREST GROUP	BYLAW 45/26 DEGREE	BYLAW 45/38 DEGREE	BYLAW C-2/8.0
Property Owner	Residual Land Values drop well below current market prices representing a maximum potential of $16.5 Million (64%) decrease from market value	Residual Land Values are approximately in line with current market prices. Potential for more value if retail Mall environment is enhanced	Residual Land Values are significantly above current market prices representing approximately $24.3 Million (94%) increase above market value
Municipality	While the direct net revenues to the Municipality from the Mall would not be as great as in C-2/8.0 revenues from other city core areas would probably increase to offset this	While the direct net revenues to the Municipality from the Mall would not be as great as in C-2/8.0 revenues from other city core areas would probably increase to offset this	Highest direct net revenue from the Mall. High intensity development on Mall may reduce development elsewhere in the core
Merchants	Greatest negative impact is Rideau Centre which reduces sales per square foot by about 14%. Increase in sales per square foot due to employment lowest of the three options at about 10% increase.	Greatest negative impact is Rideau Centre. Positive employment-related effect is about 15% and quality/environment related effect could result in highest overall positive impact on Mall retail activity	Greatest negative impact is Rideau Centre. Increase in sales per square foot due to employment increase is highest (about 17%). There will be decline in sales/sq.ft. due to environment effect
Mall Users	Good environmental conditions conducive to shopping and strolling. No adverse sunlight or wind conditions	Similar to 45/26 degree except that in late autumn and winter months not as much sun exposure on Mall	Loss of sunlight on Mall all year round. Potentially disturbing wind conditions due to high buildings

EXHIBIT 10.3: SUMMARY OF TRADEOFFS - HIGH DENSITY VERSUS RESTRICTED DENSITY

	ZONING POLICY	
Item	High Density	Restricted Density
Primary Benefit Areas	. property owners . city fiscal position	. public . retail merchants . City
Qualifications	. land value is potential only-dependent on land assembly and development conditions . no financial impact on City since development would occur elsewhere based on demand	
Tradeoffs	. significant reduction in quality of Mall - result in decreases in shoppers expenditures not offset by additional employment - cause losses in tourism retail expenditures - fail to distinguish Mall as interesting, active retail and pedestrian area - diminish the focus the Mall provides to Central Area West - diminish the general attractiveness of Central Area West for shopping vis-a-vis Rideau Centre/Byward Market	. reductions in development potential would: - reduce potential returns to property owners - create possible disincentives to development - reduce potential employment-related retail expenditures for Mall merchants

10.2.2 General Economic Impacts

Full development under the C-2/8.0 zoning policy option is likely to result in significant reductions of retail sales generated by tourists, estimated to be $80 million over 5 years, because of the diminished attractiveness of the Mall for pedestrians. For all zoning options there will be no negative impacts for employment and incomes generally in Central Area West. There may be small reductions in retail employment per square foot due to reduced retail sales per square foot performance.

The environmental analysis indicated that the Mall micro-climate would be severely affected by full development under the C-2/8.0 zoning option. This, in turn, would reduce the attraction of the Mall for pedestrians and could ultimately diminish the importance of the Mall as a shopping and tourist attraction and as an active open air urban space.

10.2.3 Summary of Direct Impacts

a. Financial Impacts - Redevelopment

The potential financial impacts of the 45 ft./26 degree zoning policy option are considered too onerous for property owners. This option does not balance a pedestrian mall environment objective with an objective for encouraging retail activity. Moreover, it is so restrictive as to potentially discourage redevelopment in the study area. The analysis indicates that either the 45 ft./38 degree or the C2/8.0 zoning option offer a much better financial return to property owners.

b. Financial Impacts - Renovation

Renovation alone is not financially attractive if one has to account for purchase of the building. Of course, it may be argued that some existing owners, having

already written down their buildings, could pursue a feasible renovation project. As well there may be business interests who would pay a premium for a Mall location, irrespective of the economics of renovation.

The renovation/redevelopment combination generally has considerably more potential financially, specifically for the angular zoning options. Pursuing a combined renovation/redevelopment project could improve the financial attractiveness of developments under these options. Certainly for the 45 ft.(13.7m)/38 degree option it could result in a sound proposition in today's market.

c. Municipal Benefits

The 45 ft./26 degree option substantially diminishes the net benefits to the municipality from potential redevelopment. Arguably, redevelopment would take place elsewhere in the City and tax returns would be derived from that redevelopment in any case. At the same time it may not achieve the City's objective of supporting retail trade on the Mall. In this case the proposed zoning action may not achieve one of the key City objectives.

d. Environmental Impacts

The 45 ft./26 degree zoning policy option maximizes the degree of sunlight penetration to the Mall volume, although not to the Mall surface itself, and indirectly assists in reducing negative environmental factors such as wind generated by office towers. There is virtually no difference in sunlight penetration in the February to October period between the 26 and 38 degree options. Given that the October to February period has less sunlight per day than the February to October period,

the 26 degree option offers little advantage when compared with the benefits of higher density development. The C2/8.0 zoning policy option will substantially diminish sunlight penetration to the Mall - to a point where it would be unacceptable. In this case there would be little to distinguish the Sparks Street Mall from other shopping areas and shoppers could choose other shopping areas simply from the perspective of comfort.

e. Retail Trade

Employment in the immediate area is an important contributor to the total retail sales generated on the Sparks Street Mall. The 45ft./38 degree option offers the greatest benefit to retail trade. The advantages in employment-related effects of the C-2/8.0 option will be partially be offset by the potential negative effects on the environment. The greatest impact, however, is expected to be a decline in retail sales per sq.ft. due to Rideau Centre. The combined Rideau Centre/Byward Market competition will also be a disincentive to east/west shopping movement.

10.3 Conclusions

10.3.1 Mall Role

The combination of discussions we have had and the analysis we have undertaken leads us to believe that the most appropriate role for the Sparks Street Mall is one which combines the attributes of a financial and office district with high quality retail facilities and supporting restaurants and entertainment. We further believe that redevelopment of this portion of the Sparks Street Mall area should pursue an objective of strong association to Parliament Hill and should be complementary to

this feature.

10.3.2 High Density Versus Restricted Density

We conclude that the preferable course of action for the City to follow is adoption of a zoning policy which restricts density. Permitting full development under the C-2/8.0 zoning policy option would not be in the best interests of the City of Ottawa. The potentially severe environmental impacts will, in our estimation, lead to significant reductions in retail trade, tourism and diminish the importance of the Mall's role as a focus of activity in the Ottawa Central Area West.

10.3.3 Zoning Policy

Based on the role we believe appropriate for the Mall, we conclude that the 45 ft./26 degree and C2/8.0 zoning policy options are not appropriate for controlling development on the south side of Sparks Street Mall between Bank and Metcalfe Streets. However we do conclude that the City's proposed zoning policy structure (a height limit and building envelope oefined by an angle from permitted heights on Sparks Street) is sound and should be maintained. Our analysis indicates that the 26 degree angle is too restrictive from the point of view of property owners and, therefore, a zoning policy option of 45ft./38 degree type is an appropriate one to further this objective. Particular attention, though, should be paid to certain sites fronting on Sparks Street which do not extend through to Queen Street and which, therefore, are most affected by such a zoning option.

Design Elements

a. Building Heights at Sparks Street

A height limit of 45 feet at the Mall is important in maintaining a pedestrian scale, sunlight penetration and in diminishing negative wind affects from office towers.

The 45 foot height restriction should be maintained for new development. For heritage facade retention it would be worthwhile to allow penetration of the 45 foot height limit only for the portion of the site immediately behind the facade.

b. Retail Locations

It is our view that the retail character of the Sparks Street Mall in this area should be maintained by requiring retail frontage on the Mall with separate access to individual retail facilities. There should be no setbacks on the Mall and interior retail malls should not be permitted in redevelopments.

c. Design Flexibility

There should be some flexibility in the application of zoning policy where a proposed design would obviously serve the objectives for the Sparks Street Mall area better than a solution under a fixed zoning bylaw. The City should consider a process of development review and the development of detailed design guidelines to support that process once a final role for Sparks Street Mall is selected. The basic zoning requirement should be based on a bylaw of the 45ft./38 degree type with provision for greater intensity of use through a development review process. Moreover, in the application of an angular control, the City should permit penetration of that angle by core areas of buildings to a maximum dimension of 30% of the length of the building's frontage on Sparks Street. These core areas would not substantially affect sunlight penetration and would enable more density of development.

d. Heritage

Some heritage related renovation or facade retention would add to the sense of the Mall as a pleasant pedestrian area. We conclude that there are financially viable opportunities for combined renovation/redevelopment projects. Moreover, for through block sites, the combination of the location of heritage buildings (on Sparks Street) and the zoning policy structure (permitting higher densities on Queen Street) are complementary conditions. Therefore we believe that the City should encourage renovation where appropriate along the Sparks Street Mall.

Land Use

The location of the Sparks Street Mall leads us to conclude that the most appropriate primary uses for redevelopment in the study area are office and retail with an emphasis on high quality. Retail uses should be encouraged along the Mall and in the area of the elevated pedestrian system with linkages through to the Mall where possible. At the present time there are few restaurants on the Mall and an effort should be made to encourage more. Entertainment activities such as cinemas are unlikely except in a major full block redevelopment but these activities should be encouraged as the opportunity arises.

Parking spaces for shoppers are a significant problem in the study area. The City should encourage more parking to support retail activities, including assessing its present zoning bylaw (which does not require parking) with a view to amendments to require parking spaces available to the public. Alternatively, the City, through its parking authority, should seek or participate in construction of a parking facility.

APPENDIX A

PEDESTRIAN SURVEY

1.0 Introduction

A survey of pedestrians on the Sparks Street Mall was undertaken in October/November of 1982. The purpose of the survey was to identify the demographic and expenditure characteristics as well as the place of work and residence of persons visiting the Mall.

The survey involved a random sampling technique but was limited to five selected days in the late fall. The results themselves cannot be said to be typical of an average day on the Mall over a full year. For instance, summer and Christmas season behaviour patterns are likely to be somewhat different, particularly for those Mall visitors who do not work in close proximity to the Mall or who are non-employed residents in the Ottawa/Hull area. Moreover, the summer season is the peak time for tourism and the number of tourists who visit the Mall is certain to be much greater in the summer than during the survey period. Nevertheless, the results are indicative of behaviour characteristics for one part of the year, providing a better basis for any judgements about activity in other seasons.

Selected survey results are presented below.

1.1 Characteristics of Shoppers

Of the 801 respondents in the pedestrian survey, 82.6% were Anglophone and 17.3% were Francophone. Of the total, 54.6% were male and 45.3% female (Exhibit A.1). The highest percentage of both males and females surveyed were in the 25-34 year age bracket (19% and 44% respectively) with 15-24 being the next highest age bracket (12.2% for males and females). The fewest numbers of respondents were under 14 (0.1%) and over 65 (4.6%) (Exhibit A.2). A third of the respondents live in a two person household and of those, 14.3% are between the ages of 25-34. Twenty-one percent of those surveyed live alone (again most of these between 25-34). Seventeen percent live in three person households and 15% in four person households. Relatively few of

EXHIBIT A.1: RESPONDENT BY SEX AND LANGUAGE

	LANGUAGE (%)		
Sex	Anglophone	Francophone	TOTAL
Male	45.3	9.36	54.68
Female	37.32	7.99	45.31
Total	82.63	17.35	100

EXHIBIT A.2: RESPONDENTS BY SEX AND AGE

	AGE							
	0-14	15-24	25-34	35-44	45-54	55-64	64+	Total
Male (%)	0.12	12.23	19.03	9.88	6.92	4.44	1.85	54.51
Female (%)	0	12.23	14.46	8.52	4.07	3.33	2.84	45.48
Total	0.12	24.47	33.49	18.41	11.0	7.78	4.69	100

those interviewed live in households of five or more, a total of 12.1%. (Exhibit A.3).

As shown in Exhibit A.4, the family income of a third of the respondents is over $45,000, 26% each have a family income of $15-29,000 and $30-45,000 and 14.6% earn less than $15,000.

1.2 Visiting Characteristics

The majority of respondents spent a half hour or less on the Mall as shown in Exhibit A.5 below.

EXHIBIT A.5 TIME SPENT IN MALL

Time (hours)	% of respondents
0-1/2	58.4
1/2 -1	21.1
1 - 2	11.8
2 +	8.6
Total	100

There was a surprising number of return visits to the Mall as illustrated in Exhibit A.6, with 30% of respondents visiting the Mall at least 20 times in October.

EXHIBIT A.6 FREQUENCY OF VISITS

Approximate no. of visits in October	% of respondents
0	6.6
1	14.4
2	9.6
4	18.4
8	8.4
12	8.2
16	4.3
20	29.8
Total	100

1.3 Mode of Transport to Mall

Over half of the people surveyed (53.7%) walked to the Mall. The mode of transport for 22.7% of respondents was bus, while 21% drove. Only 1.8% came to the Mall by bicycle and 0.7% by taxi.

EXHIBIT A.3: RESPONDENTS BY AGE AND HOUSEHOLD SIZE

	HOUSEHOLD SIZE (%)							
	1	2	3	4	5	6	7+	TOTAL
Age								
0-14	0	0.11	0	0	0	0	0	0.11
15-24	3.94	7.29	4.78	3.46	1.91	1.79	1.19	24.4
25-34	8.13	14.35	5.14	3.58	1.19	0.47	0.23	33.13
35-44	2.87	3.94	2.99	5.02	2.39	0.35	0.59	18.18
45-54	2.63	2.63	2.99	1.79	0.83	0.23	0.59	11.72
55-64	1.79	2.99	1.67	0.95	0.23	0	0.11	7.77
65 +	2.27	2.15	0	0.11	0.11	0	0	4.66
Total	21.65	33.49	17.58	14.95	6.69	2.87	2.75	100

EXHIBIT A.4: RESPONDENTS BY AGE AND INCOME

	INCOME (%)				
	Less than 15K	15-29K	30-45K	45+K	TOTAL
AGE					
0-14	0	0	0.13	0	0.13
15-24	6.54	8.01	5.34	5.2	25.1
25-34	4.67	9.61	10..4	9.47	33.91
35-44	0.53	3.60	6.14	7.87	18.15
45-54	0.40	2.0	2.67	6.4	11.48
55-64	0.93	1.6	1.33	3.73	7.61
65+	160	1.3	0.13	0.53	3.6
TOTAL	14.68	26.1	25.9	33.24	100

For employees in the Ottawa/Hull region, the figures were somewhat different. Sixty percent walked to the Mall, 19.9% drove; and 18% arrived by bus. When asked the way he/she had walked on the way to the Mall, 31.2% mentioned via Bank Street, 11.9% mentioned via the Byward Market, and the majority (56.7%) responded that they had arrived via another route. The results were almost identical when people interviewed were asked the area they were planning to walk through when leaving the Mall.

1.4 Purchases

The majority of respondents had made no purchases when interviewed. More purchase transactions were made on Day 1 (117) than on other days. Purchases decreased daily to a low of 40 on Day 5. On Day 1 more purchases were made for drugs, cigarettes and magazines than for any other type of merchandise (32%). On Day 2 respondents bought more clothing and shoes (32.5%); on Day 3 more purchases were made for goods and restaurants (31.7%); on Day 4 for clothing and shoes (34%); and on Day 5 for food and restaurants (35%) (Exhibit A.7).

As shown in Exhibit A.8, respondents working in Zone 1 made most of their purchases on clothing and shoes and/or food and restaurants (47.8%).

1.5 Reasons for Visiting the Mall

Exhibit A.9 shows the reasons given by respondents for their visit to the Mall. The majority of Ottawa/Hull employees came to shop (36%) followed by walking through (23%), financial services (15%), window shopping (13%), eating (10%), other reasons (8%), professional services (5%) and meeting friends (2%). The ordering of activities for core area employees and other visitors to the Mall are very similar. Shopping was always a primary activity, followed by walking through, window shopping and/or banking.

EXHIBIT A.7: FREQUENCY OF PURCHASES BY DAY

Day	Day 1 (Fri)		Day 2 (Sat)		Day 3 (Wed)		Day 4 (Mon)		Day 5 (Tues	
Type of Goods	P	N/P	P	N/P	P	N/P	P	N/P	P	N/P
Clothing/ Shoes	23	238	29	131	15	139	15	124	11	93
Drugs, Cigs, Mags, etc.	38	224	12	151	11	142	4	137	5	100
Gifts, Cameras, Art	16	247	12	150	6	149	5	135	6	98
Food, Restaur- ants	25	239	18	145	20	135	8	134	14	90
Other	15	248	18	145	11	144	12	129	5	100
TOTAL	117	1196	89	722	63	709	44	659	40	481

P - Purchase
N/P - No Purchase

EXHIBIT A.8: FREQUENCY OF PURCHASES BY AREA

Goods Type	Purchases		
	Ottawa/Hull Employees	Other	Zone 1 Employees (Core Area)
Clothing/Shops	24.5%	29.8%	22.6%
Drugs, Cigs, Mag.	22.8	14	25.2
Gifts, Cameras, Art	12.2	14	9.4
Food Restaurants	25.7	20.2	28.3
Other	14.8	22	14.5
	100.0	100.0	100.0

EXHIBIT A.9: REASON FOR VISIT TO MALL

Purpose	Responses		
	Ottawa/Hull Employees	Other	Core Employees
Shopping	36.4	42.6	31.7
Eating	10	7	12.1
Prof. Services	5.3	3.7	4.2
Financial Services	15.3	12.4	15.6
Walking Through	22.6	22.3	23.7
Window Shopping/ Browsing	12.6	23.6	9.2
Meeting friends	1.7	3.3	0.8
Other	8.3	6.2	10
	100	100	100

APPENDIX B

DEVELOPMENT PROGRAM AND

DIRECT IMPACT ASSUMPTIONS

DEVELOPMENT PROGRAM ASSUMPTIONS

1. Construction Costs

A quantity survey approach was employed to derive cost differentials by type of use for a typical development under each of the three bylaw options. The approach assumes quality buildings with high speed elevators, glass exterior walls at ground level and a 50% glass to concrete cladding ratio for all other floors. Site geology, structural requirements, mechanical, electrical etc. were included in the costing. To arrive at possible differentials by bylaw policy a sample site and land use mix (retail on the ground floor and office above) was assumed. The per square foot results are outlined below.

	BYLAW				
	C-2/8.0	45 FT/38 DEGREES		45 FT/26 DEGREES	
USE	BASE	COST	% CHANGE	COST	% CHANGE
Overall Cost	$ 64.61	$ 69.51	+7.6	$ 75.68	+17.13
Office	63.91	68.64	+7.4	74.66	+16.82
Retail	71.55	76.28	+6.61	82.30	+15.02
Parking					
1 level(2200 SF)	60.60	60.60	-	60.60	-
4 levels(2200 SF)	45.26	45.26	-	45.26	-

2. Development Cost Assumptions

Development cost assumptions other than construction costs have been estimated using a typical office/retail building as a base. The development costs do not include provision for the carrying cost of land. These costs could vary substantially for both time

periods and land prices depending on the nature of the assembly required. In the discussion of residual land value results (section 7.0) adjustments are identified to account for land carrying costs. The assumptions are outlined below.

Item	% of Construction Costs
Professional Fees	6%
Development Overheads(misc., legal, permits, etc.)	5%
Leasing Commission and Marketing(1)	6.9%
Interim Financing(2)	
of Construction	12.5%
of Soft Costs	10.6%
Development Management Fee(3)	5.6%
	47.6%

(1) Leasing assumes 5 year lease base.
(2) Interim Financing assumes 14% interest and 1.5 year construction period.
(3) Management fee set at 4% of all other creation costs.

3. Revenue Assumptions

All revenues are net revenues per square foot. The revenues selected are higher than current market rates for existing space in this area (about $17, 15 and $12-13 net per square foot for prime, average and sub-average space respectively). The higher rate is chosen since it is reflective of the longer term office market. Space quality has been divided into three types, based on a judgement of desirability by location within a building.

Expected Net Revenues Per Square Foot

Space Quality	Space Type	
	Office	Retail
prime	$ 23	$ 25
average	20	20
sub-average	17	15

4. Space Efficiency Assumptions

Estimates of non-leasable space by by-law option including core area and services areas were made. An attempt was made in the building concept designs to minimize extra core area for buildings under the angle by-law options.

By-Law Option	Non-Leasable Space
C-2/8-0	12%
45 ft/38 degrees	15%
45 ft/26 degrees	15%

5. Space Assignments

5.1 Retail

Retail gross floor space assignments were made by parcel based on assumptions of 100 foot depth retail spaces, retail on all street or mall frontages where possible (exclusive of building entrances and service areas), and 2nd floor retail in association with the elevated pedestrian system where appropriate. The retail space assignment is outlined below.

Parcel	Retail Square Footage
1W	34480
2W	19000
3W	15300
4W	5100
5W	8279
1E	53800
2E	10200
Full Block	156067

This retail space was then divided in quality types with Sparks and Bank frontage assumed to be prime space, O'Connor to be average space and Queen and interior building space to be sub-average. This breakdown is shown in Exhibit B.1.

EXHIBIT B.1: RETAIL SPACE - QUALITY ASSIGNMENT

SITE	RETAIL SPACE	QUALITY PRIME	AVERAGE	SUB-AVERAGE
1W	34480	13300	9300	17700
2W	19000	8000	-	11000
3W	15300	8900	-	6400
4W	5100	5100	-	-
5W	8279	5000	3279	-
1E	53800	16900	19200	17700
2E	10200	6600	-	3600
	146159			
Full Block	156067	50000	50000	56067

5.2 Office

Office assignments were then made to the remaining space by parcel. These assignments are shown in Exhibits B.2 to B.4 along with the assumptions for each. Because of varying building configurations the quality assignments have been differentiated by building.

6. Implementation Schedule

Total proposed built space for each of the scenarios is shown below.

	Partial Assembly	Full Block - West Partial Assembly - East
Zoning Policy	Total Space	Total Space
45 ft./26 degrees	937216	1145971
45 ft./38 degrees	1181745	1432677
C-2/8.0 FSI	1433310	1804427

Office construction in the core area has amounted to approximately 600,000 square feet per year. Given the amount of space proposed in the scenarios for the two study blocks a reasonable implementation schedule for development of these sites is about six years. This would provide for an absorption on the two blocks of about 156,000 square feet per year on average for the lowest scenario increasing to about 300,000 square feet per year for the highest. Although the whole question of implementation is hypothetical, choosing a six year implementation schedule does give a picture of the impact stream of the development in terms of employment and municipal taxes and expenditures.

EXHIBIT B2 : OFFICE SPACE ASSIGNMENT - 45/26 DEGREES

SITE	FLOOR SPACE	RETAIL SPACE	TOTAL OFFICE	QUALITY PRIME	QUALITY AVERAGE	QUALITY SUB-AVERAGE
7W	109280	15300	93980	44171	40411	9398
8W	29786	5100	24686	-	24686	-
10W	84372	8279	76093	76093	-	-
2W	151224	19000	132224	56856	58179	17189
1W	157223	34480	122743	122743	-	-
1E	248629	53800	194829	136380	38966	19483
2E	156702	10200	146502	68856	83776	19483
Full Block	614086	156067	458019	258019	150000	50000

Assumptions: 10W - all prime
8W - average
7W - 47% prime/43% average/10% sub-average
2W - 43% prime/44% average/13% sub-average
1W - all prime
1E - 70% prime/20% average/10% sub-average
2E - 47% prime/43% average/10% sub-average

EXHIBIT B3 : OFFICE SPACE ASSIGNMENT 45/38 DEGREES

SITE	FLOOR SPACE	RETAIL	TOTAL OFFICE	QUALITY PRIME	QUALITY AVERAGE	QUALITY SUB-AVERAGE
7W	136504	15300	121204	71395	40411	9398
8W	33510	5700	28410	-	28410	-
10W	95424	8279	87145	87145	-	-
2W	197420	19000	178420	103052	58179	17189
1W	198851	34480	164371	137771	26600	-
1E	321688	53800	267888	209439	38966	19483
2E	198348	10200	188148	84889	83776	19483
Full Block	770968	156067	614901	414901	150000	50000

Assumptions: 10W - prime
8W - average
All other sites - average and sub-average stay constant & prime increases

EXHIBIT B4 : OFFICE SPACE ASSIGNMENT C-2/8.0

SITE	FLOOR SPACE	RETAIL	TOTAL OFFICE	QUALITY PRIME	QUALITY AVERAGE	QUALITY SUB-AVERAGE
7W	169759	15300	154459	104650	40411	9398
8W	62733	5100	57633	-	57633	-
10W	95424	8279	87145	87145	-	-
2W	229701	19000	210701	135333	58179	17189
1W	249323	34480	214843	214483	-	-
1E	378854	53800	325054	266605	38966	19483
2E	247516	10200	237316	134057	83776	19483
Full Block	997487	156067	841420	641420	150000	50000

Assumptions: Corner lots or portions of buildings with greater than 2 side windows exposure - prime

All other space - average and sub-average constant, prime increases

Full block - prime 76%

DIRECT IMPACT ASSUMPTIONS

1. Taxation Assumptions

1.1 Calculation of Assessment as % of Market Value

The proposed developments are assumed to be similar to Class A (prime) or Class B (average) buildings in the downtown. These categories are used in the assessment process and hence are used here to correspond as closely as possible to actual assessment estimates. Therefore the assessment is assumed to be equivalent to either of these types, as appropriate. Since assessment is on a 1975 market value basis a bench mark Class A structure was used

to derive assessment amounts as a function of estimated market value. Figures on square footage were obtained from Provincial Assessment as well as current assessments.

1.1.1 Current Assessment

Retail/Office per sq.ft.	- $ 10.48
Storage per sq.ft.	- 3.90
Blended assessment (proportionate to space)	- 10.28

1.1.2 Bench mark Structure - Estimated Market Value

A 1982 market value for the structure was calculated based on space figures from Provincial Assessment and assuming a 0.88 net net factor, 4% vacancy and collection, 0.14 capitalization rate and $23.00 per sq.ft. net net rent.

Estimated market value per sq.ft. - $138.79

1.1.3 Assessment as % of market value

Class A buildings - $\frac{10.28}{138.79} = .0741$

Assessment for Class B buildings is assumed to be proportionately lower.

Current Class B assessment - office/retail - $9.32 per sq.ft.

Blended Class B is $\frac{10.28}{10.48} \times \$9.32 = \$9.14$

Class B is $\frac{9.14}{10.28}$ or 0.8893 of Class A

Class B assessment as % of market value is 0.0659

2. Tax Rates

2.1 1982 Mill Rates

Realty - $240.71 per $1000 assessed value

Business - $237.81 per $1000 assessed value

50% tax-exempt government occupancy, has been assumed and grants-in-lieu equivalent to 40% of this portion was used. A 50% factor for the amount of assessment on which tenants in the private sector would pay business tax was assumed. This factor was estimated using curent averages for sample office/retail buildings in the study area.

Business Tax - $107.01 per 1000 assessment

2.2 Business Tax as % of Rent

Class A -	Blended Assessment	- $10.28 per sq.ft.
	Business Assessment proportion at 45%	- $ 4.626
	Business Tax	- $ 0.495
Class B -	Blended Assessment	- $ 9.14
	Business Assessment proportion at 45%	- $ 4.113
	Business Tax	- $ 0.440

3. Existing Assessments and Tax Revenues (1982)

Parcel	Assessment	Tax Revenue
1W	$ 519,104	$178,386.81
2W	625,195	216,505.78
3W	395,776	147,683.54
4W	181,291	55,314.86
5W	286,682	91,128.88
1E	782,244	244,237.68
2E	451,995	166,654.21
West Block	$2,691,245	$943,882.70

4. Municipal Expenditures

Municipal and regional expenditures increases are assumed to increase as a proportion of the increase in total assessment. The proportion of total assessment for net municipal and regional expenditures for services other than education, is 0.092 on average over the last four years. This ratio is assumed to apply to the study area.

5. Traffic Impacts

The assumptions used to estimate traffic impacts were developed in consultation with the City. Person trip rates are assumed to be 17.5 person trips per 1000 sq. ft. of gross floor area. The remaining assumptions are outlined below.

	Day	AM	PM	Weekend
Modal Split	.30	.70	.70	.17
Hour Factor(%)	1.0	.12	.15	.03
Inbound(%)	.50	.85	.15	.50
Average Car Occupancy	1.7	1.3	1.3	1.8

6. Employment Generation

A sample of seven blocks in Central Area West was reviewed (Blocks 6, 19, 25, 26, 27, 33 and 34) to determine an average office floor space ratio per employee. These blocks generally include newer office buildings and therefore reflect what is proposed on Sparks St. Average retail space is assumed to correspond to the central Area ratio.

	Retail	Office
Average space per employee	269 sq.ft.	343 sq.ft.

Source: Updates of the Central Area Data Bank, 1981, City of Ottawa

APPENDIX C

MODEL RESULTS

APPENDIX C

This appendix includes copies of the computer model results by zoning policy and assembly option as described in Chapters 5 and 6. For each of the six options financial, fiscal, demographic and traffic impacts are set out. As well the building program for each option is reproduced and elasticities of residual land values to key variables is shown. The building program table indicates a floor area ratio for each parcel. The ratio is the gross floor area of development divided by the site area. It is not equivalent to the City's Floor Space Index (FSI) formula. FSI's based on the City's formula are indicated in Chapter 5 of this report.

EXHIBIT C1 : PARTIAL ASSEMBLY : 45 FEET/26 DEGREES

SPARKS STREET MALL
DEVELOPMENT PROGRAM

	PARCEL 1W	PARCEL 2W	PARCEL 3W	PARCEL 4W	PARCEL 5W	PARCEL 1E	PARCEL 2E	TOTAL	%
BUILDING PROGRAM (UNITS)									
OFFICE 1	123	57	44	0	76	136	69	505	
OFFICE 2	0	58	40	25	0	99	84	246	
OFFICE 3	0	17	9	0	0	19	19	65	
RETAIL 1	13	8	9	5	5	17	7	64	
RETAIL 2	9	0	0	0	3	12	0	32	
RETAIL 3	12	11	6	0	0	18	4	51	
PARKING (INT)	0	0	0	0	0	0	0	0	
FLOOR AREA (SQ FT)									
OFFICE 1	122741	56865	44171	0	76093	136380	68856	505108	52
OFFICE 2	0	58179	40411	24686	0	38964	83776	246016	26
OFFICE 3	0	17189	9398	0	0	19483	19483	65553	7
RETAIL 1	13300	8000	8900	5100	5000	16900	6600	63800	7
RETAIL 2	9300	0	0	0	3279	19200	0	31779	3
RETAIL 3	11880	11000	6400	0	0	17700	3600	50580	5
PARKING (INT)	0	0	0	0	0	0	0	0	0
TOTAL BUILDING AREA	157223	151233	109280	29786	84372	248629	182315	962838	100
DEVELOPMENT LAND AREA - NET	26467	24079	18009	7065	10746	40013	26268	152647	
DEVELOPER SURFACE ELEMENTS	0	0	0	0	0	0	0	0	
DEVELOPMENT LAND AREA - GROSS	26467	24079	18009	7065	10746	40013	26268	152647	
FAR NET	5.940	6.280	6.068	4.215	7.851	6.213	6.940	6.307	
FAR GROSS	5.940	6.280	6.068	4.215	7.851	6.213	6.940	6.307	
TOT NON-DEVELOPER SURF ELEMENTS	0	0	0	0	0	0	0	0	

EXHIBIT C1 : PARTIAL ASSEMBLY : 45 FEET/26 DEGREES

SPARKS STREET MALL
DEVELOPER'S COSTS

	PARCEL 1W	PARCEL 2W	PARCEL 3W	PARCEL 4W	PARCEL 5W	PARCEL 1E	PARCEL 2E	TOTAL	%
BUILDING CONSTRUCTION COSTS (CONST $M)									
OFFICE 1	9.289	4.303	3.342	.000	5.758	10.321	5.211	38.226	
OFFICE 2	.000	4.402	3.058	1.868	.000	2.948	6.340	18.618	
OFFICE 3	.000	1.300	.711	.000	.000	1.474	1.474	4.961	
RETAIL 1	1.094	.658	.732	.419	.411	1.390	.543	5.250	
RETAIL 2	.765	.000	.000	.000	.269	1.580	.000	2.615	
RETAIL 3	.977	.905	.526	.000	.000	1.456	.296	4.162	
TOT BUILDING CONSTR COSTS	12.126	11.571	8.371	2.287	6.440	19.172	13.865	73.835	68
DEVELOPMENT COST	5.772	5.507	3.984	1.089	3.065	9.126	6.599	35.145	32
TOT CREATION COST - DEVELOPER	17.899	17.078	12.356	3.377	9.505	28.298	20.464	108.981	100
BY YEAR									
1983	8.949	8.539	6.178	.000	.000	.000	.000	23.667	22
1984	8.949	8.539	6.178	.000	.000	.000	.000	23.667	22
1985	.000	.000	.000	3.377	4.752	14.149	.000	22.279	20
1986	.000	.000	.000	.000	4.752	14.149	.000	18.902	17
1987	.000	.000	.000	.000	.000	.000	10.232	10.232	9
1988	.000	.000	.000	.000	.000	.000	10.232	10.232	9
BUILDING ECONOMIC VALUE (CONST $M)									
OFFICE 1	16.454	7.623	5.921	.000	10.200	18.282	9.230	67.713	
OFFICE 2	.000	6.782	4.710	2.877	.000	4.542	9.765	28.678	
OFFICE 3	.000	1.703	.931	.000	.000	1.930	1.930	6.495	
RETAIL 1	1.938	1.165	1.296	.743	.728	2.462	.961	9.296	
RETAIL 2	1.084	.000	.000	.000	.382	2.238	.000	3.704	
RETAIL 3	1.038	.961	.559	.000	.000	1.547	.314	4.422	
PARKING (INT)	.000	.000	.000	.000	.000	.000	.000	.000	
TOT ECONOMIC VALUE	20.515	18.235	13.419	3.620	11.311	31.003	22.203	120.311	
RESIDUAL LAND VALUE	2.616	1.156	1.063	.243	1.806	2.705	1.738	11.329	
RESIDUAL LAND VALUE/SQ FT	99	48	59	35	168	68	66	74	

EXHIBIT C1 : PARTIAL ASSEMBLY : 45 FEET/26 DEGREES

SPARKS STREET MALL
RESIDUAL LAND VALUE ELASTICITIES

BUILDING TYPE	CONSTR COST	DEV. COST	REVE-NUES	NET-NET FACTOR	VACANCY RATE
OFFICE 1	-4.979	-1.606	5.976	5.976	-.249
OFFICE 2	-2.425	-.782	2.531	2.531	-.105
OFFICE 3	-.646	-.208	.573	.573	-.023
RETAIL 1	-.684	-.220	.820	.820	-.034
RETAIL 2	-.340	-.109	.326	.326	-.013
RETAIL 3	-.542	-.174	.390	.390	-.016
ALL TYPES	-9.618	-3.102	10.618	10.618	-.442

EXHIBIT C1 : PARTIAL ASSEMBLY : 45 FEET/26 DEGREES

SPARKS STREET MALL
MUNICIPAL INDICATORS (CONST $000)

	PARCEL 1W	PARCEL 2W	PARCEL 3W	PARCEL 4W	PARCEL 5W	PARCEL 1E	PARCEL 2E	TOTAL
EXISTING ASSESSMENT	519.1	625.1	395.7	181.2	286.6	782.2	451.9	3242.2
EXISTING CITY TAX REVENUE	178.3	216.5	147.6	55.3	91.1	244.2	166.6	1099.9
OTHER EXIST MUNIC REVENUE	.0	.0	.0	.0	.0	.0	.0	.0
NEW TOTAL ASSESSMENT	1502.7	1273.8	943.5	244.7	835.0	2213.2	1546.7	8559.9
NEW RESIDENTIAL TAX	.0	.0	.0	.0	.0	.0	.0	.0
NEW COMMERCIAL TAX	361.7	306.6	227.1	58.9	201.0	532.7	372.3	2060.4
NEW TOTAL TAX	361.7	306.6	227.1	58.9	201.0	532.7	372.3	2060.4

EXHIBIT C1 : PARTIAL ASSEMBLY : 45 FEET/26 DEGREES

SPARKS STREET MALL
COSTS AND BENEFITS (CONST $000) - MUNICIPALITY

	1983	1984	1985	1986	1987	1988	1989	...
TOTAL CREATION COST	.0	.0	.0	.0	.0	.0	.0	
OTHER MUNICIPAL EXPENSES (NET)	100.2	200.5	297.4	388.5	438.8	489.2	489.2	
FORGONE TAX REVENUES	271.3	542.5	765.5	933.2	1016.5	1099.6	1099.6	
OTHER FORGONE MUNICIP REVENUES	.0	.0	.0	.0	.0	.0	.0	
TOTAL COSTS	371.5	743.1	1063.0	1321.7	1455.4	1589.1	1589.1	
REVENUES								
PROPERTY TAXES - RESIDENTIAL	.0	.0	.0	.0	.0	.0	.0	
PROPERTY TAXES - COMMERCIAL	447.7	895.4	1321.2	1688.1	1874.3	2060.4	2060.4	
PER CAPITA REVENUES	.0	.0	.0	.0	.0	.0	.0	
TOTAL REVENUES	447.7	895.4	1321.2	1688.1	1874.3	2060.4	2060.4	
NET-BENEFIT	76.1	152.3	258.2	366.3	418.8	471.3	471.3	

EXHIBIT C1 : PARTIAL ASSEMBLY : 45 FEET/24 DEGREE

CEARD'S STREET MALL
DEMOGRAPHIC DATA

	PARCEL 1W	PARCEL 2W	PARCEL 3W	PARCEL 4W	PARCEL 5W	PARCEL 1E	PARCEL 2E	TOTAL	%
CUMULATIVE EMPLOYMENT									
1983	277	274	197	0	0	0	0	749	22
1984	557	547	374	0	0	0	0	1478	43
1985	557	547	374	107	154	441	0	2200	64
1986	557	547	374	107	307	882	0	2795	81
1987	557	547	374	107	307	882	335	3130	90
1988	557	547	374	107	307	882	470	3465	100

EXHIBIT C1 : PARTIAL ASSEMBLY : 45 FEET/26 DEGREES

SPARKS STREET MALL
TRANSPORTATION INDICATORS

	PARCEL 1W	PARCEL 2W	PARCEL 3W	PARCEL 4W	PARCEL 5W	PARCEL 1E	PARCEL 2E	TOTAL
DAILY PERSON TRIPS	2751	2647	1912	521	1477	4351	3191	18850
TRIPS BY TRANSIT (DY)	829	794	574	156	443	1305	957	5058
IN	413	397	287	78	221	653	479	2529
OUT	413	397	287	78	221	653	479	2529
TRIPS BY TRANSIT (AM)	231	222	161	44	124	365	268	1415
IN	196	189	137	37	105	311	228	1203
OUT	35	33	24	7	19	55	40	212
TRIPS BY TRANSIT (PM)	289	278	201	55	155	457	335	1770
IN	43	42	30	8	23	69	50	265
OUT	246	236	171	47	132	388	285	1504
TRIPS BY TRANSIT (MK)	14	13	10	3	8	22	16	86
IN	7	7	5	1	4	11	8	43
OUT	7	7	5	1	4	11	8	43
AUTO TRIPS (DY)	1052	1012	731	197	565	1664	1220	6443
IN	526	506	366	100	282	832	610	3221
OUT	526	506	366	100	282	832	610	3221
AUTO TRIPS (AM)	63	61	44	12	34	100	74	389
IN	54	52	38	10	29	85	63	331
OUT	10	9	7	2	5	15	11	58
AUTO TRIPS (PM)	79	76	55	15	43	126	92	486
IN	12	11	8	2	6	19	14	73
OUT	67	65	47	13	36	107	78	413
AUTO TRIPS (MK)	37	35	25	7	20	58	43	225
IN	18	18	13	3	10	29	21	112
OUT	18	18	13	3	10	29	21	112
OTHER TRIPS (DY)	138	132	96	26	74	218	160	842
OTHER TRIPS (AM)	17	16	11	3	9	26	19	101
OTHER TRIPS (PM)	21	20	14	4	11	33	24	126
OTHER TRIPS (MK)	2	2	2	0	1	4	3	15

EXHIBIT C2 : PARTIAL ASSEMBLY : 45 FEET/38 DEGREES

SPARKS STREET MALL
DEVELOPMENT PROGRAM

	PARCEL 1W	PARCEL 2W	PARCEL 3W	PARCEL 4W	PARCEL 5W	PARCEL 1E	PARCEL 2E	TOTAL	%
BUILDING PROGRAM (UNITS)									
OFFICE 1	138	103	71	0	87	209	85	694	
OFFICE 2	27	58	40	28	0	39	84	276	
OFFICE 3	0	17	9	0	0	19	19	66	
RETAIL 1	13	8	9	5	5	17	7	64	
RETAIL 2	9	0	0	0	3	19	0	32	
RETAIL 3	12	11	6	0	0	18	4	51	
PARKING (INT)	0	0	0	0	0	0	0	0	
FLOOR AREA (SQ FT)									
OFFICE 1	137771	103052	71395	0	87145	209439	84889	693691	59
OFFICE 2	26600	58179	40411	28410	0	38966	83776	276342	23
OFFICE 3	0	17189	9398	0	0	19483	19483	65553	6
RETAIL 1	13300	8000	8900	5100	5000	16900	6600	63800	5
RETAIL 2	9300	0	0	0	3279	19200	0	31779	3
RETAIL 3	11880	11000	6400	0	0	17700	3600	50580	4
PARKING (INT)	0	0	0	0	0	0	0	0	0
TOTAL BUILDING AREA	198851	197420	136504	33510	95424	321688	198348	1181743	100
DEVELOPMENT LAND AREA - NET	26467	24079	18009	7065	10746	40013	26268	152647	
DEVELOPER SURFACE ELEMENTS	0	0	0	0	0	0	0	0	
DEVELOPMENT LAND AREA - GROSS	26467	24079	18009	7065	10746	40013	26268	152647	
FAR NET	7.513	8.198	7.579	4.743	8.879	8.039	7.550	7.741	
FAR GROSS	7.513	8.198	7.579	4.743	8.879	8.039	7.550	7.741	
TOT NON-DEVELOPER SURF ELEMENTS	0	0	0	0	0	0	0	0	

EXHIBIT C2 : PARTIAL ASSEMBLY : 45 FEET/38 DEGREES

SPARKS STREET MALL
DEVELOPER'S COSTS

	PARCEL 1W	PARCEL 2W	PARCEL 3W	PARCEL 4W	PARCEL 5W	PARCEL 1E	PARCEL 2E	TOTAL	%
BUILDING CONSTRUCTION COSTS (CONST $M)									
OFFICE 1	9.456	7.073	4.900	.000	5.981	14.375	5.826	47.614	
OFFICE 2	1.825	3.993	2.773	1.950	.000	2.674	5.750	18.968	
OFFICE 3	.000	1.179	.645	.000	.000	1.337	1.337	4.497	
RETAIL 1	1.014	.610	.678	.389	.381	1.289	.503	4.866	
RETAIL 2	.709	.000	.000	.000	.250	1.464	.000	2.424	
RETAIL 3	.906	.839	.488	.000	.000	1.350	.274	3.858	
TOT BUILDING CONSTR COSTS	13.912	13.696	9.486	2.339	6.613	22.491	13.692	82.231	68
DEVELOPMENT COST	6.622	6.519	4.515	1.113	3.147	10.706	6.517	39.142	32
TOT CREATION COST - DEVELOPER	20.534	20.215	14.002	3.452	9.761	33.197	20.210	121.374	100
BY YEAR									
1983	10.267	10.107	7.001	.000	.000	.000	.000	27.376	23
1984	10.267	10.107	7.001	.000	.000	.000	.000	27.376	23
1985	.000	.000	.000	3.452	4.880	16.598	.000	24.931	21
1986	.000	.000	.000	.000	4.880	16.598	.000	21.479	18
1987	.000	.000	.000	.000	.000	.000	10.105	10.105	8
1988	.000	.000	.000	.000	.000	.000	10.105	10.105	8
BUILDING ECONOMIC VALUE (CONST $M)									
OFFICE 1	18.469	13.814	9.571	.000	11.682	28.076	11.380	92.994	
OFFICE 2	3.100	6.782	4.710	3.311	.000	4.542	9.765	32.213	
OFFICE 3	.000	1.703	.931	.000	.000	1.930	1.930	6.495	
RETAIL 1	1.938	1.165	1.296	.743	.728	2.462	.961	9.296	
RETAIL 2	1.084	.000	.000	.000	.382	2.238	.000	3.704	
RETAIL 3	1.038	.961	.559	.000	.000	1.547	.314	4.422	
PARKING (INT)	.000	.000	.000	.000	.000	.000	.000	.000	
TOT ECONOMIC VALUE	25.630	24.427	17.069	4.054	12.793	40.797	24.352	149.126	
RESIDUAL LAND VALUE	5.095	4.212	3.067	.602	3.032	7.600	4.142	27.752	
RESIDUAL LAND VALUE/SQ FT	193	175	170	85	282	190	158	182	

EXHIBIT C2 : PARTIAL ASSEMBLY : 45 FEET/38 DEGREES

SPARKS STREET MALL
RESIDUAL LAND VALUE ELASTICITIES

BUILDING TYPE	CONSTR COST	DEV. COST	REVE-NUES	NET-NET FACTOR	VACANCY RATE
OFFICE 1	-2.532	-.816	3.350	3.350	-.119
OFFICE 2	-1.008	-.325	1.160	1.160	-.048
OFFICE 3	-.239	-.077	.234	.234	-.009
RETAIL 1	-.258	-.083	.334	.334	-.013
RETAIL 2	-.128	-.041	.133	.133	-.005
RETAIL 3	-.205	-.066	.159	.159	-.006
ALL TYPES	-4.373	-1.410	5.373	5.373	-.223

EXHIBIT C2 : PARTIAL ASSEMBLY : 45 FEET/30 DEGREES

SPARKS STREET MALL
MUNICIPAL INDICATORS (CONST $000)

	PARCEL 1W	PARCEL 2W	PARCEL 3W	PARCEL 4W	PARCEL 5W	PARCEL 1E	PARCEL 2E	TOTAL
EXISTING ASSESSMENT	519.1	625.1	395.7	181.2	286.6	782.2	451.9	3242.2
EXISTING CITY TAX REVENUE	178.3	216.5	147.6	55.3	91.1	244.2	166.6	1099.9
OTHER EXIST MUNIC REVENUE	.0	.0	.0	.0	.0	.0	.0	.0
NEW TOTAL ASSESSMENT	1856.4	1732.6	1213.9	273.3	944.8	2939.0	1706.0	10666.2
NEW RESIDENTIAL TAX	.0	.0	.0	.0	.0	.0	.0	.0
NEW COMMERCIAL TAX	446.8	417.0	292.2	65.7	227.4	707.4	410.6	2567.4
NEW TOTAL TAX	446.8	417.0	292.2	65.7	227.4	707.4	410.6	2567.4

EXHIBIT C2 : PARTIAL ASSEMBLY : 45 FEET/30 DEGREES

SPARKS STREET MALL
COSTS AND BENEFITS (CONST $000) - MUNICIPALITY

	1983	1984	1985	1986	1987	1988	1989	...
TOTAL CREATION COST	.0	.0	.0	.0	.0	.0	.0	
OTHER MUNICIPAL EXPENSES (NET)	150.0	300.1	438.1	567.6	625.3	683.0	683.0	
FORGONE TAX REVENUES	271.2	542.5	765.5	933.2	1016.5	1099.9	1099.9	
OTHER FORGONE MUNICIP REVENUES	.0	.0	.0	.0	.0	.0	.0	
TOTAL COSTS	421.3	842.7	1203.7	1500.8	1641.9	1782.9	1782.9	
REVENUES								
PROPERTY TAXES - RESIDENTIAL	.0	.0	.0	.0	.0	.0	.0	
PROPERTY TAXES - COMMERCIAL	578.0	1156.1	1689.3	2156.8	2362.1	2567.4	2567.4	
PER CAPITA REVENUES	.0	.0	.0	.0	.0	.0	.0	
TOTAL REVENUES	578.0	1156.1	1689.3	2156.8	2362.1	2567.4	2567.4	
NET-BENEFIT	156.6	313.3	485.6	655.9	720.2	784.5	784.5	

EXHIBIT C2 : PARTIAL ASSEMBLY : 45 FEET/38 DEGREES

SPARKS STREET MALL
DEMOGRAPHIC DATA

	PARCEL 1W	PARCEL 2W	PARCEL 3W	PARCEL 4W	PARCEL 5W	PARCEL 1E	PARCEL 2E	TOTAL	%
CUMULATIVE EMPLOYMENT									
1983	356	360	248	0	0	0	0	963	23
1984	712	719	496	0	0	0	0	1927	45
1985	712	719	496	121	174	577	0	2798	65
1986	712	719	496	121	348	1154	0	3549	83
1987	712	719	496	121	348	1154	365	3914	91
1988	712	719	496	121	348	1154	730	4279	100

EXHIBIT C2 : PARTIAL ASSEMBLY : 45 FEET/38 DEGREES

SPARKS STREET MALL
TRANSPORTATION INDICATORS

	PARCEL 1W	PARCEL 2W	PARCEL 3W	PARCEL 4W	PARCEL 5W	PARCEL 1E	PARCEL 2E	TOTAL
DAILY PERSON TRIPS	3480	3455	2389	586	1670	5630	3471	20681
TRIPS BY TRANSIT (DY)	1044	1036	717	176	501	1689	1041	6204
IN	522	518	358	88	250	844	521	3102
OUT	522	518	358	88	250	844	521	3102
TRIPS BY TRANSIT (AM)	292	290	201	49	140	473	292	1737
IN	248	247	171	42	119	402	248	1477
OUT	44	44	30	7	21	71	44	261
TRIPS BY TRANSIT (PM)	365	363	251	62	175	591	364	2171
IN	55	54	38	9	26	89	55	326
OUT	311	308	213	52	149	502	310	1846
TRIPS BY TRANSIT (WK)	18	18	12	3	9	29	18	105
IN	9	9	6	1	4	14	9	53
OUT	9	9	6	1	4	14	9	53
AUTO TRIPS (DY)	1331	1321	913	224	638	2152	1327	7907
IN	665	660	457	112	319	1076	664	3954
OUT	665	660	457	112	319	1076	664	3954
AUTO TRIPS (AM)	80	80	55	14	39	130	80	477
IN	68	68	47	12	33	110	68	406
OUT	12	12	8	2	6	19	12	72
AUTO TRIPS (PM)	100	100	69	17	48	162	100	597
IN	15	15	10	3	7	24	15	89
OUT	85	85	59	14	41	138	85	507
AUTO TRIPS (WK)	46	46	32	8	22	75	46	276
IN	23	23	16	4	11	38	23	138
OUT	23	23	16	4	11	38	23	138
OTHER TRIPS (DY)	174	173	119	29	83	281	174	1034
OTHER TRIPS (AM)	21	21	14	4	10	34	21	124
OTHER TRIPS (PM)	26	26	18	4	13	42	26	155
OTHER TRIPS (WK)	3	3	2	1	2	5	3	19

EXHIBIT C3 : PARTIAL ASSEMBLY : C-2/8.0

SPARKS STREET MALL
DEVELOPMENT PROGRAM

	PARCEL 1W	PARCEL 2W	PARCEL 3W	PARCEL 4W	PARCEL 5W	PARCEL 1E	PARCEL 2E	TOTAL	%
BUILDING PROGRAM (UNITS)									
OFFICE 1	215	135	105	0	87	267	134	943	
OFFICE 2	0	58	40	58	0	39	84	279	
OFFICE 3	0	17	9	0	0	19	19	66	
RETAIL 1	13	8	9	5	5	17	7	64	
RETAIL 2	9	0	0	0	3	19	0	32	
RETAIL 3	12	11	6	0	0	18	4	51	
PARKING (INT)	0	0	0	0	0	0	0	0	
FLOOR AREA (SQ FT)									
OFFICE 1	214843	135333	104650	0	87145	266605	134057	942633	66
OFFICE 2	0	58179	40411	57633	0	38966	83776	278965	19
OFFICE 3	0	17169	9398	0	0	19483	19483	65553	5
RETAIL 1	13300	8000	8900	5100	5000	16900	6600	63800	4
RETAIL 2	9300	0	0	0	3279	19200	0	31779	2
RETAIL 3	11880	11000	6400	0	0	17700	3600	50580	4
PARKING (INT)	0	0	0	0	0	0	0	0	0
TOTAL BUILDING AREA	249323	229701	169759	62733	95424	378854	247516	1433310	100
DEVELOPMENT LAND AREA - NET	26467	24079	18009	7065	10746	40013	26268	152647	
DEVELOPER SURFACE ELEMENTS	0	0	0	0	0	0	0	0	
DEVELOPMENT LAND AREA - GROSS	26467	24079	18009	7065	10746	40013	26268	152647	
FAR NET	9.420	9.539	9.426	8.879	8.879	9.468	9.422	9.389	
FAR GROSS	9.420	9.539	9.426	8.879	8.879	9.468	9.422	9.389	
TOT NON-DEVELOPER SURF ELEMENTS	0	0	0	0	0	0	0	0	

EXHIBIT C3 : PARTIAL ASSEMBLY : C-2/8.0

SPARKS STREET MALL
DEVELOPER'S COSTS

	PARCEL 1W	PARCEL 2W	PARCEL 3W	PARCEL 4W	PARCEL 5W	PARCEL 1E	PARCEL 2E	TOTAL	%
BUILDING CONSTRUCTION COSTS (CONST $M)									
OFFICE 1	13.730	8.649	6.688	.000	5.569	17.038	8.567	60.243	
OFFICE 2	.000	3.718	2.582	3.683	.000	2.490	2.354	15.826	
OFFICE 3	.000	1.098	.600	.000	.000	1.245	1.245	4.187	
RETAIL 1	.951	.572	.636	.364	.357	1.209	.472	4.564	
RETAIL 2	.225	.000	.000	.000	.234	1.373	.000	1.833	
RETAIL 3	.850	.787	.457	.000	.000	1.266	.257	3.619	
TOT BUILDING CONSTR COSTS	16.197	14.825	10.966	4.048	6.161	24.622	12.895	93.713	68
DEVELOPMENT COST	7.710	6.857	5.219	1.926	2.933	11.720	10.568	44.734	32
TOT CREATION COST - DEVELOPER	23.907	21.682	16.186	5.975	9.094	36.344	23.463	136.854	100
BY YEAR									
1983	11.953	10.841	8.093	.000	.000	.000	.000	30.888	23
1984	11.953	10.841	8.093	.000	.000	.000	.000	30.888	23
1985	.000	.000	.000	5.975	4.547	18.172	.000	28.694	21
1986	.000	.000	.000	.000	4.547	18.172	.000	22.719	17
1987	.000	.000	.000	.000	.000	.000	11.731	11.731	9
1988	.000	.000	.000	.000	.000	.000	11.731	11.731	9
BUILDING ECONOMIC VALUE (CONST $M)									
OFFICE 1	28.801	18.142	14.029	.000	11.682	35.740	17.971	126.367	
OFFICE 2	.000	6.282	4.310	6.778	.000	4.545	9.765	31.676	
OFFICE 3	.000	1.703	.931	.000	.000	1.930	1.930	6.495	
RETAIL 1	1.938	1.165	1.296	.743	.728	2.462	.961	9.294	
RETAIL 2	1.084	.000	.000	.000	.382	2.238	.000	3.704	
RETAIL 3	1.038	.961	.559	.000	.000	1.649	.974	4.422	
PARKING (INT)	.000	.000	.000	.000	.000	.000	.000	.000	
TOT ECONOMIC VALUE	32.862	28.755	21.527	7.461	12.793	48.461	30.944	182.805	
RESIDUAL LAND VALUE	8.954	6.872	5.341	1.486	3.698	12.116	7.480	45.950	
RESIDUAL LAND VALUE/SQ FT	338	285	297	210	344	303	285	301	

EXHIBIT C3 : PARTIAL ASSEMBLY : C-2/8.0

SPARKS STREET MALL
RESIDUAL LAND VALUE ELASTICITIES

BUILDING TYPE	CONSTR COST	DEV. COST	REVE-NUES	NET-NET FACTOR	VACANCY RATE
OFFICE 1	-1.935	-.624	2.750	2.750	-.114
OFFICE 2	-.572	-.184	.707	.707	-.029
OFFICE 3	-.134	-.043	.141	.141	-.005
RETAIL 1	-.146	-.047	.202	.202	-.008
RETAIL 2	-.073	-.023	.080	.080	-.003
RETAIL 3	-.116	-.037	.096	.096	-.004
ALL TYPES	-2.978	-.960	3.978	3.978	-.165

EXHIBIT C3 : PARTIAL ASSEMBLY : C-2/8.0

SPARKS STREET MALL
MUNICIPAL INDICATORS (CONST $000)

	PARCEL 1W	PARCEL 2W	PARCEL 3W	PARCEL 4W	PARCEL 5W	PARCEL 1E	PARCEL 2E	TOTAL
EXISTING ASSESSMENT	519.1	625.1	395.7	101.2	286.6	782.2	451.9	3242.2
EXISTING CITY TAX REVENUE	178.3	216.5	147.6	55.3	91.1	244.2	166.6	1099.9
OTHER EXIST MUNIC REVENUE	.0	.0	.0	.0	.0	.0	.0	.0
NEW TOTAL ASSESSMENT	2417.6	2053.2	1544.3	497.8	944.8	3506.8	2194.4	13159.3
NEW RESIDENTIAL TAX	.0	.0	.0	.0	.0	.0	.0	.0
NEW COMMERCIAL TAX	581.9	494.2	371.7	119.8	227.4	844.1	528.2	3167.5
NEW TOTAL TAX	581.9	494.2	371.7	119.8	227.4	844.1	528.2	3167.5

EXHIBIT C3 : PARTIAL ASSEMBLY : C-2/8.0

SPARKS STREET MALL
COSTS AND BENEFITS (CONST $000) - MUNICIPALITY

	1983	1984	1985	1986	1987	1988	1989	...
TOTAL CREATION COST	.0	.0	.0	.0	.0	.0	.0	
OTHER MUNICIPAL EXPENSES (NET)	205.8	411.7	596.4	752.0	832.2	912.3	912.3	
FORGONE TAX REVENUES	271.2	542.5	765.5	933.2	1016.5	1099.9	1099.9	
OTHER FORGONE MUNICIP REVENUES	.0	.0	.0	.0	.0	.0	.0	
TOTAL COSTS	477.1	954.2	1362.0	1685.3	1848.7	2012.2	2012.2	
REVENUES								
PROPERTY TAXES - RESIDENTIAL	.0	.0	.0	.0	.0	.0	.0	
PROPERTY TAXES - COMMERCIAL	723.9	1447.9	2103.5	2639.3	2903.4	3167.5	3167.5	
PER CAPITA REVENUES	.0	.0	.0	.0	.0	.0	.0	
TOTAL REVENUES	723.9	1447.9	2103.5	2639.3	2903.4	3167.5	3167.5	
NET-BENEFIT	246.8	493.6	741.5	954.0	1054.6	1155.2	1155.2	

EXHIBIT C3 : PARTIAL ASSEMBLY : C-2/8.0

SPARKS STREET MALL
DEMOGRAPHIC DATA

	PARCEL 1W	PARCEL 2W	PARCEL 3W	PARCEL 4W	PARCEL 5W	PARCEL 1E	PARCEL 2E	TOTAL	%
CUMULATIVE EMPLOYMENT									
1983	450	420	310	0	0	0	0	1179	22
1984	900	839	619	0	0	0	0	2358	45
1985	900	839	619	229	174	683	0	3445	66
1986	900	839	619	229	348	1366	0	4302	83
1987	900	839	619	229	348	1366	456	4759	91
1988	900	839	619	229	348	1366	913	5215	100

EXHIBIT C3 : PARTIAL ASSEMBLY : C-2/8.0

SPARKS STREET MALL
TRANSPORTATION INDICATORS

	PARCEL 1W	PARCEL 2W	PARCEL 3W	PARCEL 4W	PARCEL 5W	PARCEL 1E	PARCEL 2E	TOTAL
DAILY PERSON TRIPS	4363	4020	2971	1098	1670	6630	4332	25083
TRIPS BY TRANSIT (DY)	1309	1206	891	329	501	1989	1299	7525
IN	654	603	446	164	250	994	650	3762
OUT	654	603	446	165	250	994	650	3762
TRIPS BY TRANSIT (AM)	367	338	250	92	140	557	364	2107
IN	312	287	212	78	119	473	309	1791
OUT	55	51	39	14	21	84	55	316
TRIPS BY TRANSIT (PM)	458	422	312	115	175	696	455	2634
IN	69	63	47	17	26	104	68	395
OUT	389	359	265	98	149	592	387	2239
TRIPS BY TRANSIT (MK)	22	21	15	6	9	34	22	128
IN	11	10	8	3	4	17	11	64
OUT	11	10	8	3	4	17	11	64
AUTO TRIPS (DY)	1668	1537	1136	420	638	2535	1656	9591
IN	834	768	568	210	319	1267	828	4795
OUT	834	768	568	210	319	1267	828	4795
AUTO TRIPS (AM)	101	93	69	25	39	153	100	579
IN	86	79	58	22	33	130	85	492
OUT	15	14	10	4	6	23	15	87
AUTO TRIPS (PM)	126	116	86	32	48	191	125	724
IN	19	17	13	5	7	28	19	109
OUT	107	99	73	27	41	163	106	615
AUTO TRIPS (MK)	58	54	40	15	22	88	58	334
IN	29	27	20	7	11	44	29	167
OUT	29	27	20	7	11	44	29	167
OTHER TRIPS (DY)	218	201	149	55	83	331	217	1254
OTHER TRIPS (AM)	26	24	18	7	10	40	26	150
OTHER TRIPS (PM)	33	30	22	8	13	50	32	188
OTHER TRIPS (MK)	4	4	3	1	2	6	4	23

EXHIBIT C4 : FULL BLOCK ASSEMBLY : 45 FEET/26 DEGREES

SPARKS STREET MALL
DEVELOPMENT PROGRAM

	PARCEL WEST BLOCK	PARCEL 1E	PARCEL 2E	TOTAL	%
BUILDING PROGRAM (UNITS)					
OFFICE 1	258	136	69	463	
OFFICE 2	150	39	84	273	
OFFICE 3	50	19	19	89	
RETAIL 1	50	17	7	73	
RETAIL 2	50	19	0	69	
RETAIL 3	56	18	4	77	
PARKING (INT)	0	0	0	0	
FLOOR AREA (SQ FT)					
OFFICE 1	258019	136380	68856	463255	44
OFFICE 2	150000	38966	83776	272742	26
OFFICE 3	50000	19483	19483	88966	9
RETAIL 1	50000	16900	6600	73500	7
RETAIL 2	50000	19200	0	69200	7
RETAIL 3	56067	17700	3600	77367	7
PARKING (INT)	0	0	0	0	0
TOTAL BUILDING AREA	614086	248629	182315	1045030	100
DEVELOPMENT LAND AREA - NET	106067	40013	26268	172348	
DEVELOPER SURFACE ELEMENTS	0	0	0	0	
DEVELOPMENT LAND AREA - GROSS	106067	40013	26268	172348	
FAR NET	5.789	6.213	6.940	6.063	
FAR GROSS	5.789	6.213	6.940	6.063	
TOT NON-DEVELOPER SURF ELEMENTS	0	0	0	0	

EXHIBIT C4 : FULL BLOCK ASSEMBLY : 45 FEET/26 DEGREES

SPARKS STREET MALL
DEVELOPER'S COSTS

	PARCEL WEST BLOCK	PARCEL 1E	PARCEL 2E	TOTAL	%
BUILDING CONSTRUCTION COSTS (CONST $M)					
OFFICE 1	19.526	10.321	5.211	35.059	
OFFICE 2	11.352	7.548	1.340	20.241	
OFFICE 3	3.784	1.174	1.174	6.132	
RETAIL 1	4.115	1.390	.543	6.049	
RETAIL 2	2.112	1.580	.000	3.692	
RETAIL 3	4.614	1.456	.296	6.367	
TOT BUILDING CONSTR COSTS	47.507	19.172	13.865	80.544	68
DEVELOPMENT COST	22.613	9.126	6.594	38.334	32
TOT CREATION COST - DEVELOPER	70.120	28.298	20.464	118.884	100
BY YEAR					
1983	17.530	.000	.000	17.530	15
1984	17.530	.000	.000	17.530	15
1985	.000	14.149	.000	14.149	12
1986	17.530	14.149	.000	31.679	27
1987	17.530	.000	10.232	27.762	23
1988	.000	.000	10.232	10.232	9
BUILDING ECONOMIC VALUE (CONST $M)					
OFFICE 1	34.589	18.282	9.230	62.102	
OFFICE 2	17.485	4.542	9.765	31.793	
OFFICE 3	4.954	1.930	1.930	8.815	
RETAIL 1	7.285	2.462	.963	10.710	
RETAIL 2	5.028	2.238	.000	8.066	
RETAIL 3	4.901	1.547	.314	6.764	
PARKING (INT)	.000	.000	.000	.000	
TOT ECONOMIC VALUE	75.045	31.003	22.203	128.253	
RESIDUAL LAND VALUE	4.924	2.705	1.738	9.368	
RESIDUAL LAND VALUE/SQ FT	46	68	66	54	

EXHIBIT C4 : FULL BLOCK ASSEMBLY : 45 FEET/26 DEGREES

SPARKS STREET MALL
RESIDUAL LAND VALUE ELASTICITIES

BUILDING TYPE	CONSTR COST	DEV. COST	REVE-NUES	NET-NET FACTOR	VACANCY RATE
OFFICE 1	-5.523	-1.781	6.628	6.628	-.276
OFFICE 2	-3.251	-1.048	3.393	3.393	-.141
OFFICE 3	-1.060	-.342	.940	.940	-.039
RETAIL 1	-.953	-.307	1.143	1.143	-.047
RETAIL 2	-.897	-.289	.861	.861	-.035
RETAIL 3	-1.003	-.323	.721	.721	-.030
ALL TYPES	-12.689	-4.092	13.689	13.689	-.570

EXHIBIT C4 : FULL BLOCK ASSEMBLY : 45 FEET/26 DEGREES

SPARKS STREET MALL
MUNICIPAL INDICATORS (CONST $000)

	PARCEL WEST BLOCK	PARCEL 1E	PARCEL 2E	TOTAL
EXISTING ASSESSMENT	2764.1	782.2	451.9	3998.3
EXISTING CITY TAX REVENUE	953.7	244.2	166.6	1364.6
OTHER EXIST MUNIC REVENUE	.0	.0	.0	.0
NEW TOTAL ASSESSMENT	5288.8	2213.2	1546.7	9048.9
NEW RESIDENTIAL TAX	.0	.0	.0	.0
NEW COMMERCIAL TAX	1273.0	532.7	372.3	2178.1
NEW TOTAL TAX	1273.0	532.7	372.3	2178.1

EXHIBIT C4 : FULL BLOCK ASSEMBLY : 45 FEET/26 DEGREES

SPARKS STREET MALL
COSTS AND BENEFITS (CONST $000) - MUNICIPALITY

	1983	1984	1985	1986	1987	1988	1989	...
TOTAL CREATION COST	.0	.0	.0	.0	.0	.0	.0	
OTHER MUNICIPAL EXPENSES (NET)	58.0	116.1	181.9	305.8	414.2	464.6	464.6	
FORGONE TAX REVENUES	238.4	476.8	599.0	959.5	1281.3	1364.6	1364.6	
OTHER FORGONE MUNICIP REVENUES	.0	.0	.0	.0	.0	.0	.0	
TOTAL COSTS	296.5	593.0	780.9	1265.4	1695.6	1829.3	1829.3	
REVENUES								
PROPERTY TAXES - RESIDENTIAL	318.2	636.5	902.9	1487.5	1992.0	2178.1	2178.1	
PROPERTY TAXES - COMMERCIAL	.0	.0	.0	.0	.0	.0	.0	
PER CAPITA REVENUES								
TOTAL REVENUES	318.2	636.5	902.9	1487.5	1992.0	2178.1	2178.1	
NET-BENEFIT	21.7	43.5	121.9	222.1	296.3	348.8	348.8	

EXHIBIT C5 : FULL BLOCK ASSEMBLY : 45 FEET/30 DEGREES

SPARKS STREET MALL
DEVELOPMENT PROGRAM

	PARCEL WEST BLOCK	PARCEL 1E	PARCEL 2E	TOTAL	%
BUILDING PROGRAM (UNITS)					
OFFICE 1	415	209	85	709	
OFFICE 2	140	39	84	273	
OFFICE 3	50	19	19	88	
RETAIL 1	50	17	7	73	
RETAIL 2	50	19	0	69	
RETAIL 3	56	18	4	77	
PARKING (INT)	0	0	0	0	
FLOOR AREA (SQ FT)					
OFFICE 1	414901	209439	84889	709229	55
OFFICE 2	150000	38966	83776	272742	21
OFFICE 3	50000	19483	19483	88966	7
RETAIL 1	50000	16900	6600	72500	6
RETAIL 2	50000	19200	0	69200	5
RETAIL 3	56067	17700	3600	77367	6
PARKING (INT)	0	0	0	0	0
TOTAL BUILDING AREA	770968	321688	198348	1291002	100
DEVELOPMENT LAND AREA - NET	106067	40013	26268	172348	
DEVELOPER SURFACE ELEMENTS	0	0	0	0	
DEVELOPMENT LAND AREA - GROSS	106067	40013	26268	172348	
FAR NET	7.268	8.039	7.550	7.490	
FAR GROSS	7.268	8.039	7.550	7.490	
TOT NON-DEVELOPER SURF ELEMENTS	0	0	0	0	

EXHIBIT C5 : FULL BLOCK ASSEMBLY : 45 FEET/38 DEGREES

SPARKS STREET MALL
DEVELOPER'S COSTS

	PARCEL WEST BLOCK	PARCEL 1E	PARCEL 2E	TOTAL	%
BUILDING CONSTRUCTION COSTS (CONST $M)					
OFFICE 1	28.478	14.375	5.826	48.681	
OFFICE 2	10.296	2.674	5.750	18.721	
OFFICE 3	3.432	1.337	1.337	6.106	
RETAIL 1	3.814	1.289	.503	5.606	
RETAIL 2	3.814	1.464	.000	5.278	
RETAIL 3	4.276	1.350	.274	5.901	
TOT BUILDNG CONSTR COSTS	54.111	22.491	13.692	90.295	68
DEVELOPMENT COST	25.757	10.706	6.517	42.980	32
TOT CREATION COST - DEVELOPER	79.868	33.197	20.210	133.277	100
BY YEAR					
1983	19.967	.000	.000	19.967	15
1984	19.967	.000	.000	19.967	15
1985	.000	16.598	.000	16.598	12
1986	19.967	16.598	.000	36.566	27
1987	19.967	.000	10.105	30.072	23
1988	.000	.000	10.105	10.105	8
BUILDING ECONOMIC VALUE (CONST $M)					
OFFICE 1	55.620	28.076	11.380	95.077	
OFFICE 2	17.485	4.542	9.765	31.793	
OFFICE 3	4.954	1.930	1.930	8.815	
RETAIL 1	7.285	2.462	.961	10.710	
RETAIL 2	5.828	2.238	.000	8.066	
RETAIL 3	4.901	1.547	.314	6.764	
PARKING (INT)	.000	.000	.000	.000	
TOT ECONOMIC VALUE	96.076	40.797	24.352	161.227	
RESIDUAL LAND VALUE	16.207	7.600	4.142	27.950	
RESIDUAL LAND VALUE/SQ FT	153	190	158	162	

EXHIBIT C5 : FULL BLOCK ASSEMBLY : 45 FEET/38 DEGREES

SPARKS STREET MALL
RESIDUAL LAND VALUE ELASTICITIES

BUILDING TYPE	CONSTR COST	DEV. COST	REVE-NUES	NET-NET FACTOR	VACANCY RATE
OFFICE 1	-2.570	-.829	3.401	3.401	-.141
OFFICE 2	-.988	-.318	1.137	1.137	-.047
OFFICE 3	-.322	-.103	.315	.315	-.013
RETAIL 1	-.296	-.095	.383	.383	-.015
RETAIL 2	-.278	-.089	.288	.288	-.012
RETAIL 3	-.311	-.100	.242	.242	-.010
ALL TYPES	-4.768	-1.537	5.768	5.768	-.240

EXHIBIT C5 : FULL BLOCK ASSEMBLY : 45 FEET/38 DEGREES

SPARKS STREET MALL
MUNICIPAL INDICATORS (CONST $000)

	PARCEL WEST BLOCK	PARCEL 1E	PARCEL 2E	TOTAL
EXISTING ASSESSMENT	2764.1	782.2	451.9	3998.3
EXISTING CITY TAX REVENUE	953.7	244.2	166.6	1364.6
OTHER EXIST MUNIC REVENUE	.0	.0	.0	.0
NEW TOTAL ASSESSMENT	6847.2	2939.0	1706.0	11492.3
NEW RESIDENTIAL TAX	.0	.0	.0	.0
NEW COMMERCIAL TAX	1648.2	707.4	410.6	2766.3
NEW TOTAL TAX	1648.2	707.4	410.6	2766.3

EXHIBIT C5 : FULL BLOCK ASSEMBLY : 45 FEET/38 DEGREES

SPARKS STREET MALL
COSTS AND BENEFITS (CONST $000) - MUNICIPALITY

	1983	1984	1985	1986	1987	1988	1989	...
TOTAL CREATION COST	.0	.0	.0	.0	.0	.0	.0	
OTHER MUNICIPAL EXPENSES (NET)	93.9	187.8	287.0	480.1	631.7	689.4	689.4	
FORGONE TAX REVENUES	238.4	476.8	599.0	959.5	1281.3	1364.6	1364.6	
OTHER FORGONE MUNICIP REVENUES	.0	.0	.0	.0	.0	.0	.0	
TOTAL COSTS	332.3	664.7	886.0	1439.7	1913.1	2054.1	2054.1	
REVENUES								
PROPERTY TAXES - RESIDENTIAL	.0	.0	.0	.0	.0	.0	.0	
PROPERTY TAXES - COMMERCIAL	412.0	824.1	1177.8	1943.6	2560.9	2766.3	2766.3	
PER CAPITA REVENUES	.0	.0	.0	.0	.0	.0	.0	
TOTAL REVENUES	412.0	824.1	1177.8	1943.6	2560.9	2766.3	2766.3	
NET-BENEFIT	79.6	159.3	291.7	503.8	647.8	712.1	712.1	

EXHIBIT C6 : FULL BLOCK ASSEMBLY : C-2/6.0

SPARKS STREET MALL
DEVELOPMENT PROGRAM

	PARCEL WEST BLOCK	PARCEL 1E	PARCEL 2E	TOTAL	%
BUILDING PROGRAM (UNITS)					
OFFICE 1	641	267	134	1042	
OFFICE 2	150	39	84	273	
OFFICE 3	50	19	19	89	
RETAIL 1	50	17	7	73	
RETAIL 2	50	19	0	69	
RETAIL 3	56	18	4	77	
PARKING (INT)	0	0	0	0	
FLOOR AREA (SQ FT)					
OFFICE 1	641420	266605	134057	1042081	64
OFFICE 2	150000	38966	83776	272742	17
OFFICE 3	50000	19483	19483	88966	5
RETAIL 1	50000	16900	6600	73500	5
RETAIL 2	50000	19200	0	69200	4
RETAIL 3	56067	17700	3600	77367	5
PARKING (INT)	0	0	0	0	0
TOTAL BUILDING AREA	997487	378854	247516	1623860	100
DEVELOPMENT LAND AREA - NET	106067	40013	26268	172348	
DEVELOPER SURFACE ELEMENTS	0	0	0	0	
DEVELOPMENT LAND AREA - GROSS	106067	40013	26268	172348	
FAR NET	9.404	9.468	9.422	9.421	
FAR GROSS	9.404	9.468	9.422	9.421	
TOT NON-DEVELOPER SURF ELEMENTS	0	0	0	0	

EXHIBIT C6 : FULL BLOCK ASSEMBLY : C-2/8.0

SPARKS STREET MALL
DEVELOPER'S COSTS

	PARCEL WEST BLOCK	PARCEL 1E	PARCEL 2E	TOTAL	%
BUILDING CONSTRUCTION COSTS (CONST $M)					
OFFICE 1	40.993	17.038	8.567	66.599	
OFFICE 2	9.586	2.490	5.354	17.430	
OFFICE 3	3.195	1.245	1.245	5.685	
RETAIL 1	3.577	1.209	.472	5.258	
RETAIL 2	3.577	1.373	.000	4.951	
RETAIL 3	4.011	1.266	.257	5.535	
TOT BUILDNG CONSTR COSTS	64.941	24.623	15.896	105.462	68
DEVELOPMENT COST	30.912	11.720	7.566	50.199	32
TOT CREATION COST - DEVELOPER	95.854	36.344	23.463	155.662	100
BY YEAR					
1983	23.963	.000	.000	23.963	15
1984	23.963	.000	.000	23.963	15
1985	.000	18.172	.000	18.172	12
1986	23.963	18.172	.000	42.135	27
1987	23.963	.000	11.731	35.695	23
1988	.000	.000	11.731	11.731	8
BUILDING ECONOMIC VALUE (CONST $M)					
OFFICE 1	85.986	35.740	17.971	139.699	
OFFICE 2	17.485	4.542	9.765	31.793	
OFFICE 3	4.954	1.930	1.930	8.815	
RETAIL 1	7.285	2.462	.961	10.710	
RETAIL 2	5.828	2.238	.000	8.066	
RETAIL 3	4.901	1.547	.314	6.764	
PARKING (INT)	.000	.000	.000	.000	
TOT ECONOMIC VALUE	126.443	48.461	30.944	205.849	
RESIDUAL LAND VALUE	30.589	12.116	7.480	50.186	
RESIDUAL LAND VALUE/SQ FT	288	303	285	291	

EXHIBIT C6 : FULL BLOCK ASSEMBLY : C-2/8.0

SPARKS STREET MALL
RESIDUAL LAND VALUE ELASTICITIES

BUILDING TYPE	CONSTR COST	DEV. COST	REVE-NUES	NET-NET FACTOR	VACANCY RATE
OFFICE 1	-1.958	-.631	2.783	2.783	-.115
OFFICE 2	-.512	-.165	.633	.633	-.026
OFFICE 3	-.167	-.053	.175	.175	-.007
RETAIL 1	-.154	-.049	.213	.213	-.008
RETAIL 2	-.145	-.046	.160	.160	-.006
RETAIL 3	-.162	-.052	.134	.134	-.005
ALL TYPES	-3.101	-1.000	4.101	4.101	-.170

EXHIBIT C6 : FULL BLOCK ASSEMBLY : C-2/8.0

SPARKS STREET MALL
MUNICIPAL INDICATORS (CONST $000)

	PARCEL WEST BLOCK	PARCEL 1E	PARCEL 2E	TOTAL
EXISTING ASSESSMENT	2764.1	782.2	451.9	3998.3
EXISTING CITY TAX REVENUE	953.7	244.2	166.6	1364.6
OTHER EXIST MUNIC REVENUE	.0	.0	.0	.0
NEW TOTAL ASSESSMENT	9097.4	3506.8	2194.4	14798.8
NEW RESIDENTIAL TAX	.0	.0	.0	.0
NEW COMMERCIAL TAX	2189.8	844.1	528.2	3562.2
NEW TOTAL TAX	2189.8	844.1	528.2	3562.2

EXHIBIT C6 : FULL BLOCK ASSEMBLY : C-2/8.0

SPARKS STREET MALL
COSTS AND BENEFITS (CONST $000) - MUNICIPALITY

	1983	1984	1985	1986	1987	1988	1989	...
TOTAL CREATION COST	.0	.0	.0	.0	.0	.0	.0	
OTHER MUNICIPAL EXPENSES (NET)	145.6	291.3	416.6	687.6	913.4	993.6	993.6	
FORGONE TAX REVENUES	238.4	476.8	599.0	959.5	1281.3	1364.6	1364.6	
OTHER FORGONE MUNICIP REVENUES	.0	.0	.0	.0	.0	.0	.0	
TOTAL COSTS	384.1	768.2	1015.6	1647.2	2194.8	2358.3	2358.3	
REVENUES								
PROPERTY TAXES - RESIDENTIAL	.0	.0	.0	.0	.0	.0	.0	
PROPERTY TAXES - COMMERCIAL	547.4	1094.9	1516.9	2486.5	3298.0	3562.2	3562.2	
PER CAPITA REVENUES	.0	.0	.0	.0	.0	.0	.0	
TOTAL REVENUES	547.4	1094.9	1516.9	2486.5	3298.0	3562.2	3562.2	
NET-BENEFIT	163.3	326.6	501.3	839.2	1103.2	1203.9	1203.9	

EXHIBIT C5 : FULL BLOCK ASSEMBLY : 45 FEET/30 DEGREES

SPARKS STREET MALL
DEMOGRAPHIC DATA

	PARCEL WEST BLOCK	PARCEL 1E	PARCEL 2E	TOTAL	%
CUMULATIVE EMPLOYMENT					
1981	686	0	0	686	15
1983	1372	0	0	1372	30
1985	1372	572	0	1944	42
1986	2057	1154	0	3211	69
1987	2743	1154	365	4262	92
1988	2743	1154	730	4626	100

EXHIBIT C5 : FULL BLOCK ASSEMBLY : 45 FEET/30 DEGREES

SPARKS STREET MALL
TRANSPORTATION INDICATORS

	PARCEL WEST BLOCK	PARCEL 1E	PARCEL 2E	TOTAL
DAILY PERSON TRIPS	13492	5630	3471	22593
TRIPS BY TRANSIT (DY)	4048	1689	1041	6778
IN	2024	844	521	3389
OUT	2024	844	521	3389
TRIPS BY TRANSIT (AM)	1133	473	292	1898
IN	963	402	248	1613
OUT	170	71	44	285
TRIPS BY TRANSIT (PM)	1417	591	364	2372
IN	213	89	55	356
OUT	1204	502	310	2016
TRIPS BY TRANSIT (WK)	69	29	18	115
IN	34	14	9	58
OUT	34	14	9	58
AUTO TRIPS (DY)	5150	2152	1327	8630
IN	2571	1076	664	4311
OUT	2579	1076	664	4319
AUTO TRIPS (AM)	311	130	80	521
IN	265	110	68	443
OUT	47	19	12	78
AUTO TRIPS (PM)	389	162	100	652
IN	58	24	15	98
OUT	331	138	85	554
AUTO TRIPS (WK)	180	75	46	301
IN	90	38	23	151
OUT	90	38	23	151
OTHER TRIPS (DY)	675	281	174	1130
OTHER TRIPS (AM)	81	34	21	136
OTHER TRIPS (PM)	101	42	26	169
OTHER TRIPS (WK)	12	5	3	20

EXHIBIT C6 : FULL BLOCK ASSEMBLY : C-2/8.0

SPARKS STREET MALL
DEMOGRAPHIC DATA

	PARCEL WEST BLOCK	PARCEL 1E	PARCEL 2E	TOTAL	%
CUMULATIVE DEVELOPMENT					
1983	896	0	0	896	15
1984	1793	0	0	1793	31
1985	1793	683	0	2476	43
1986	2689	1366	0	4056	69
1987	3586	1366	456	5408	92
1988	3586	1366	913	5865	100

EXHIBIT C6 : FULL BLOCK ASSEMBLY : C-2/8.0

SPARKS STREET MALL
TRANSPORTATION INDICATORS

	PARCEL WEST BLOCK	PARCEL 1E	PARCEL 2E	TOTAL
DAILY PERSON TRIPS	17456	6630	4332	28417
TRIPS BY TRANSIT (DY)	5237	1989	1299	8525
IN	2618	994	650	4263
OUT	2618	994	650	4263
TRIPS BY TRANSIT (AM)	1466	557	364	2387
IN	1246	473	309	2029
OUT	220	84	55	358
TRIPS BY TRANSIT (PM)	1833	696	455	2984
IN	275	104	68	448
OUT	1558	592	387	2536
TRIPS BY TRANSIT (MK)	89	34	22	145
IN	45	17	11	72
OUT	45	17	11	72
AUTO TRIPS (DY)	6674	2535	1656	10866
IN	3337	1267	828	5433
OUT	3337	1267	828	5433
AUTO TRIPS (AM)	403	153	100	656
IN	342	130	85	557
OUT	60	23	15	98
AUTO TRIPS (PM)	504	191	125	820
IN	76	29	19	123
OUT	428	163	106	697
AUTO TRIPS (MK)	233	88	58	379
IN	116	44	29	189
OUT	116	44	29	189
OTHER TRIPS (DY)	873	331	217	1421
OTHER TRIPS (AM)	105	40	26	171
OTHER TRIPS (PM)	131	50	32	213
OTHER TRIPS (MK)	16	6	4	26

APPENDIX D

LITERATURE SEARCH -
ANNOTATED BIBLIGRAPHY

EXHIBIT D.1: ANNOTATED BIBLIOGRAPHY OF LITERATURE RELEVANT TO THE PLANNING OF THE SPARKS STREET MALL

AUTHOR	TITLE PUBLISHER	COMMENTS
Brambilla, R. Longo.g.	For Pedestrian Only: Planning Design & Management of Traffic-Free Zones Whitney,N.Y., 77	A good summary with examples of Malls and how they relate to the downtown areas of selected European and North American cities. Provides guidance on the basic reasons for Malls and the benefits to be derived from them. A process for establishing Malls is presented with general design guidelines but the detailed use of space by pedestrians or their responses to environmental factors or ways to improve Malls are not considered.
Vancouver City Planning Dept.	Central Pedestrian Weather Protection, Jan '79	Weather protection is an important factor affecting pedestrian movement and public amnity. The report summarizes: objectives, policies, design guidelines, and planning and engineering considerations. The general policy is: to encourage arcades, ownings and covered places in pedestrian areas.

APPENDIX D

LITERATURE SEARCH -
ANNOTATED BIBLIGRAPHY

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Vancouver City Planning Dept.	Central Pedestrian Weather Protection, Jan '79	Weather protection is an important factor affecting pedestrian movement and public amnity. The report summarizes: objectives, policies, design guidelines, and planning and engineering considerations. The general policy is: to encourage arcades, ownings and covered places in pedestrian areas.

EXHIBIT D.1: ANNOTATED BIBLIOGRAPHY OF LITERATURE RELEVANT TO THE PLANNING OF THE SPARKS STREET MALL (CONTINUED)

Knack,R.E,	"Pedestrian Malls: Twenty Years Later" pp 15 - 20, Planning, vol.48,no.11, Dec '82.	Most of the U.S. Malls (about 150 of them) have not lived up to their expectations as the salvation of downtown retailing. Communities are searching for ways to bring their needs up-to-date in terms of the expectations of people today. The article points out that " it is hard to tell from the literature exactly why pedestrian Malls haven't benn more successful ". Some guidelines for positive changes are presented: . think of the Mall in the context of the whole dowtown . consider the unique features of the City - the real reasons why people do not but may go downtown . good Malls use good materials - bricks or granite instead of concrete . include a mixture of spaces - covered, open, enclosed . hire a manager and maintain Mall in good repair . just a Mall isn't enough, it has

EXHIBIT D.1: ANNOTATED BIBLIGRAPHY OF LITERATURE RELEVANT TO THE PLANNING OF THE SPARKS STREET MALL (CONTINUED)

		to provide a sense of place different from the suburbs
OECD	Low - Costs Improvement of the Outdoor Environment of Urban Areas, Paris, '76	A very general summary of the low-cost actions that OECD member countries have taken to improve urban outdoor environments. Deals with: how to improve streets, play spaces, landmarks, public participation and under organization. Too general and light to be particularly helpful.
Fruin J.J.,	Pedestrian Planning & Design, Metropolitan Assoc. of Urban Designers and Environmental Planners Inc, N.Y. 1977	A detailed account of how to move pedestrians up, down and along but not related specifically to urban centre development or pedestrian Malls. Does not examine interrealtionships with land use.
Community Concepts Ltd.	City of Toronto Planning Board Criteria for Open Space Related to Non-Residential Functions in the Inner Core, 1974	The act of shopping is involving but often there is little in the immediate surroundings of shops to make the most of the activity. Surroundings are frequently not particularly responsive to people's needs. Pedestrian needs are generally ignored or misinterpreted largely because of a lack of behavioral input into the planning & design process. Open spaces must relate

EXHIBIT D.1: ANNOTATED BIBLIOGRAPHY OF LITERATURE RELEVANT TO THE PLANNING OF THE SPARKS STREET MALL (CONTINUED)

		to activity patterns and the reasons why and how people use the immediate environment. A number of guidelines focus mostly on increasing attractiveness and activities of space and their linkage to other activity areas.
Pushkarev & Zupan	Urban Space for Pedestrians M.I.T. press, 1975	This book based largely on New York experience, is perhaps the most comprehensive and apt of those reviewed. General sections provide useful information and guidelines (particularly pages 13-23, 69-74, 85-92, 156-170 and 186-204). Measured walking and sitting behavior revealed that temperature had a considerable effect on activities within small parks/sitting spaces. However, for New York people at temperatures below zero degrees C (32 degrees F) there was hardly any activity in small parks. Lunch time small park populations varied as follows:

No. People (at lunch times)	Temperature degrees F
under 10	under 32
10 - 75	35 - 55
40 - 260	55 - 80

EXHIBIT D.1: ANNOTATED BIBLIGRAPHY OF LITERATURE RELEVANT TO THE PLANNING OF SPARKS STREET MALL

Observations on walking distance and temperature are presented with comments on the quality and availability of space in which to rest/relax.
The authors make the point that of more importance than F.S.I per se is the ratio of floor area to usable public - ground level space and the quality of that space.

APPENDIX E

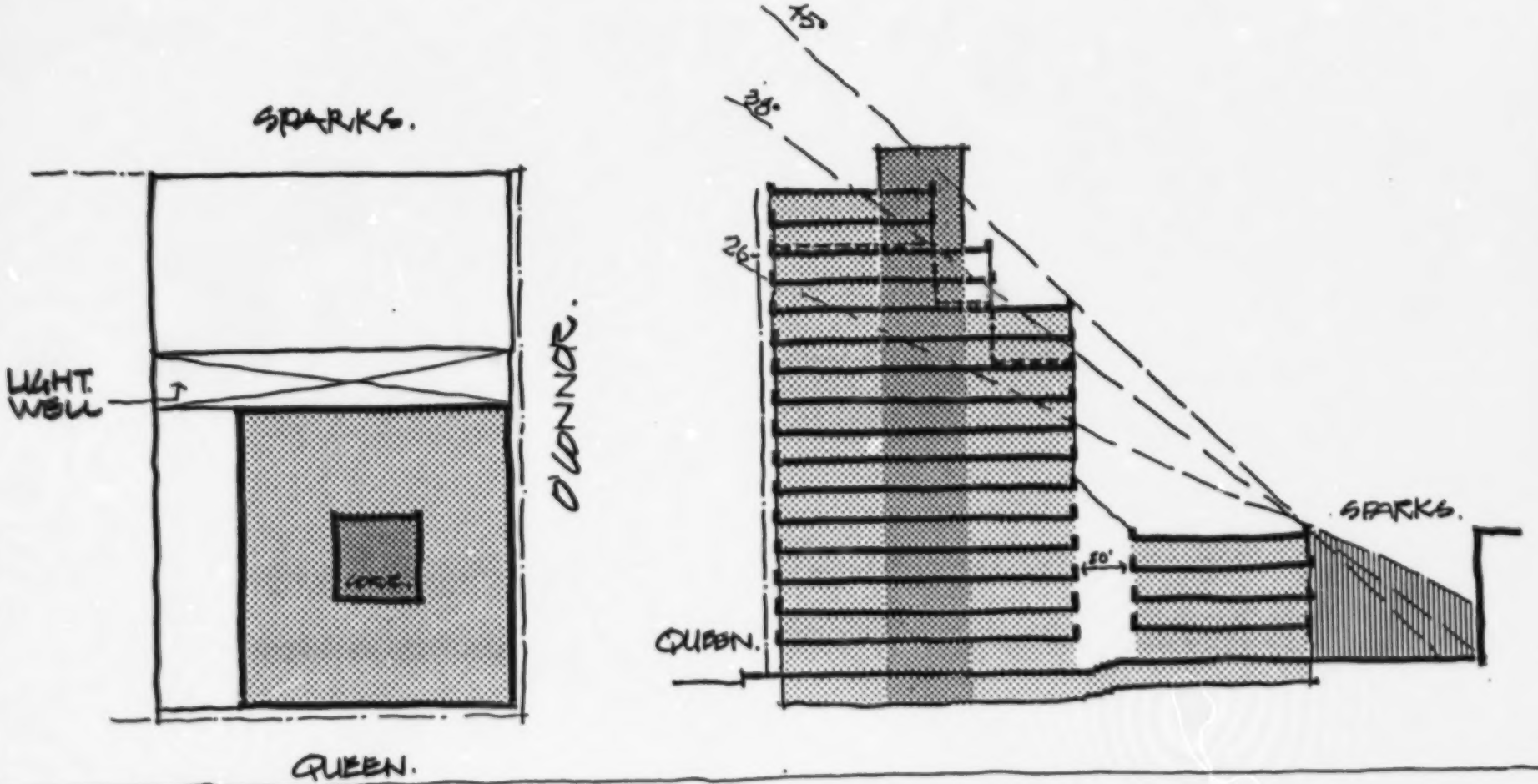
ADDITIONAL ZONING POLICY

OPTIONS

APPENDIX E

In Chapter 5 it was noted that zoning bylaw options, in addition to the three options analysed in detail, were reviewed. Exhibits E.1 to E.5 illustrate these options.

EXHIBIT E.1: SITE 1W - 45 DEGREES



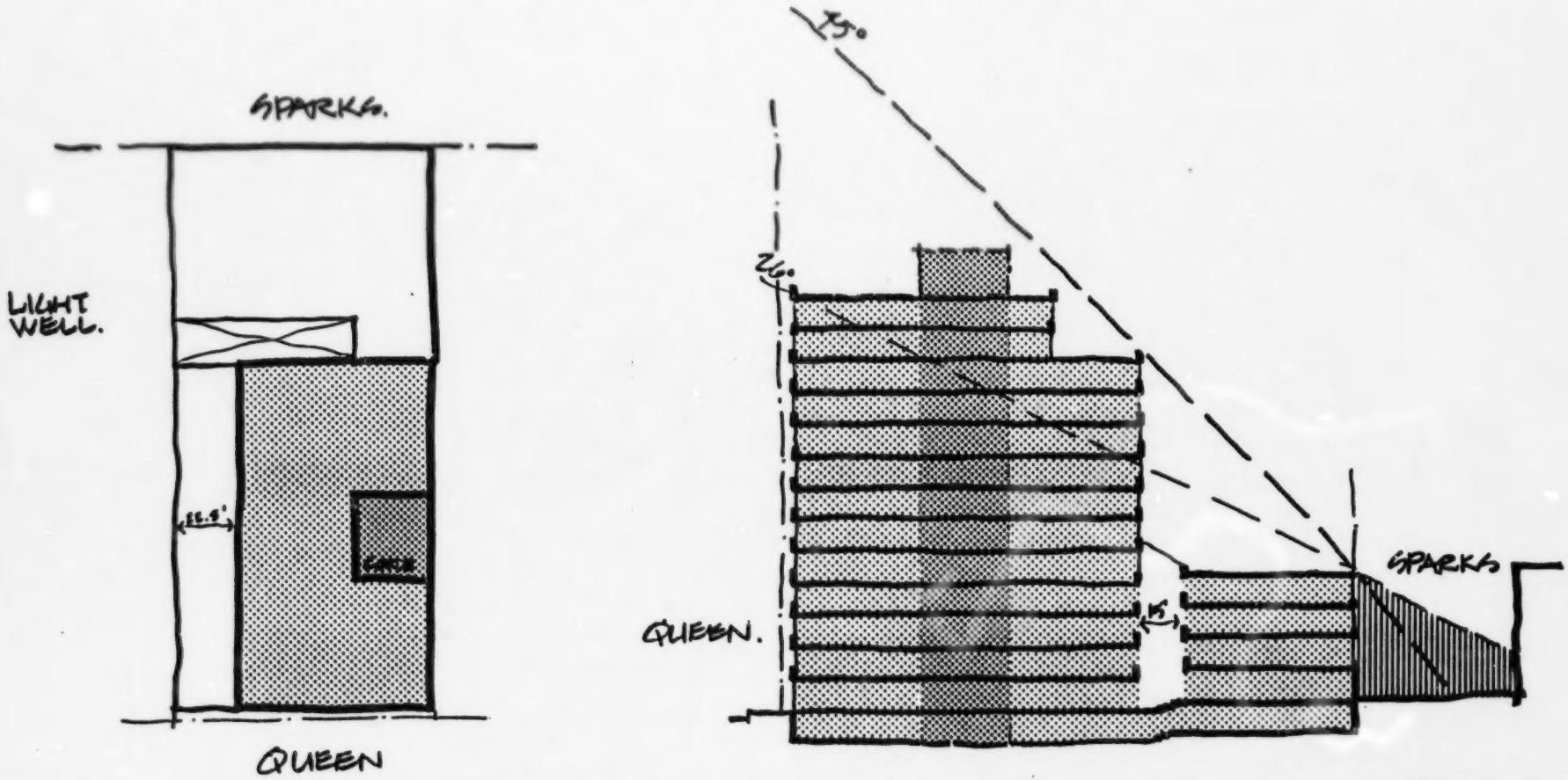
SITE 1W. AMENDED GUIDELINES/BY. LAWS.

AREA. 26,467. SQ FT.

0' 10' 20' 40' 100'

FSI: 7.6 @ 45°/26° 223,320 SQ. FT.

FSI: 6.85 @ 38°/26° 201,320 SQ. FT.

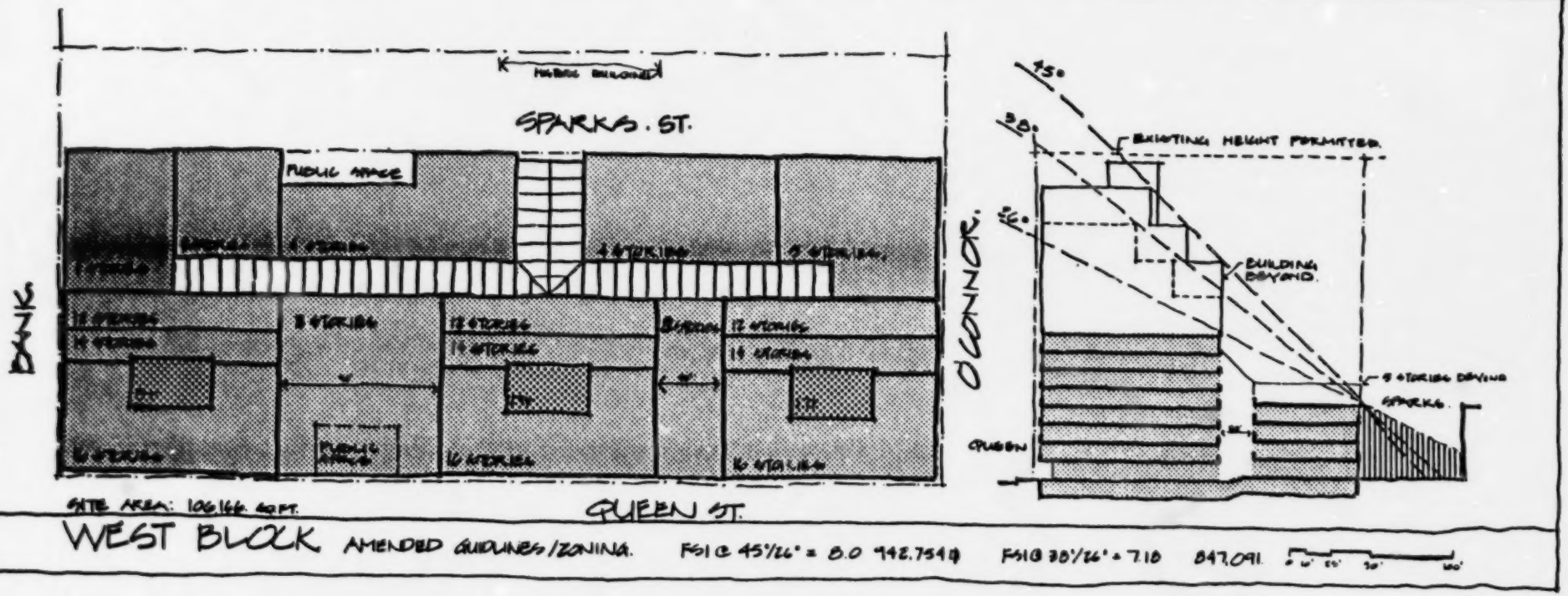


SITE 7W AMENDED GUIDELINES/BY. LAWS. FSI: 7.3 143,619 SQ. FT.

AREA: 17,711. SQ. FT. 45°/26°

0' 10' 20' 40' 100'

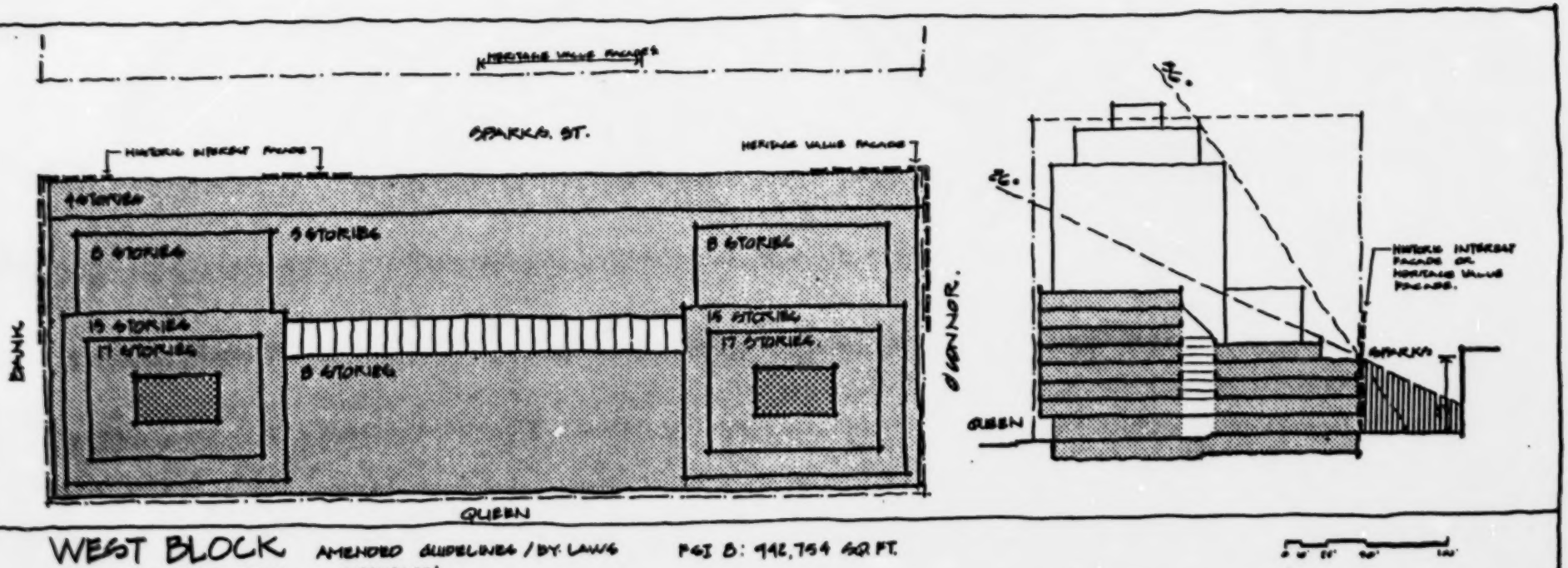
EXHIBIT E.3: WEST BLOCK - 45 DEGREES



SITE AREA: 106166 SQ FT.

WEST BLOCK AMENDED GUIDELINES/ZONING. FSI @ 45°/26' = 8.0 942.754 ft FSI @ 30°/26' = 7.10 847.091

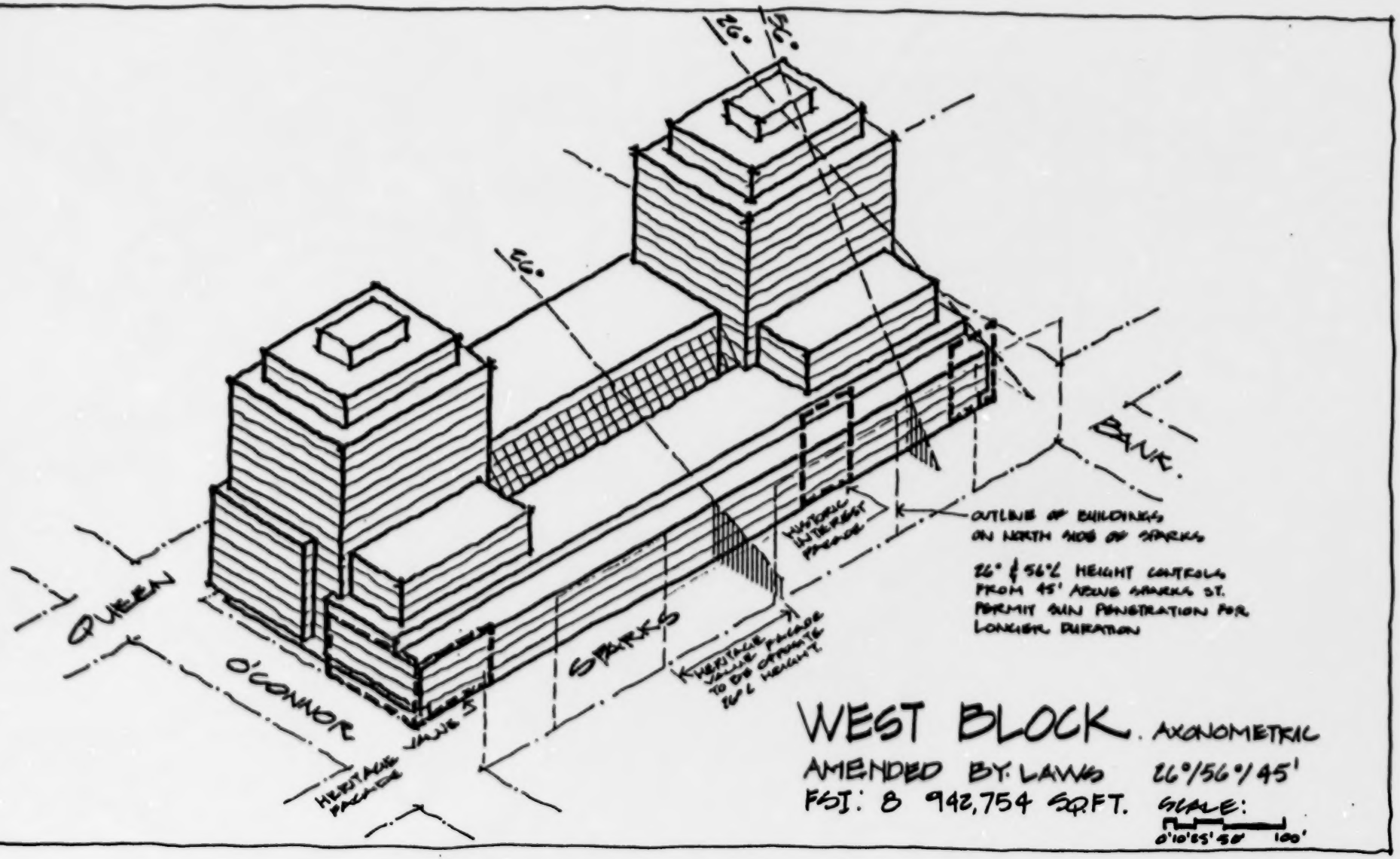
EXHIBIT E.4: WEST BLOCK - COMBINED 26/56 DEGREES



WEST BLOCK AMENDED GUIDELINES / BY-LAWS PGI B: 942,754 SQ FT.

SITE AREA: 106,166 SQ FT. 56°/26°/45°

XHIBIT E.5: WEST BLOCK - AXONOMETRIC: COMBINED 26/56 DEGREES



APPENDIX F

METRIC CONVERSIONS

APPENDIX F

This appendix contains metric conversions of all tables in the report where such conversions are applicable. The conversions are direct to ensure that the specific metric equivalent is available. The exhibit numbers are identical to those in the body of the report.

EXHIBIT 1.3: OTTAWA CENTRAL AREA LAND USE - 1981

USE	CENTRAL AREA EAST	CENTRAL AREA WEST	CENTRAL AREA TOTAL
Office (million sq.m.)	.236	1.60	1.83
Retail (thousand sq.m.)			
- DSTM	91.0	74.4	164.4
- Non DSTM	43.7	46.4	90.1
- Vacant Space	10.2	7.4	17.7
	144.9	127.2	272.2
Hotel (Units)	922	2,227	3,149
Residential (Units)	1,301	1,693	2,994
Parking (Spaces, all types)	5,575	13,229	18,804

Source: Central Area Data Bank, City of Ottawa, 1982.

EXHIBIT 1.5: CENTRAL AREA WEST-POST 1970 DEVELOPMENTS

YEAR	GROSS FLOOR SPACE (office/retail) (sq.m.)
1970	45,493
1971	164,867
1972	—
1973	15,470
1974	44,123
1975	155,045
1976	16,257
1977	150,748
1978	—
1979	—
1980	45,421
TOTAL	637,424
ANNUAL AVERAGE	63,752

Source: Compiled from various City of Ottawa sources.

EXHIBIT 1.6: OTTAWA: CENTRAL AREA PROPOSED DEVELOPMENT PROJECTS (1)

	OFFICE (million sq.m.)	RETAIL (million sq.m.)	HOTEL/APT. (units)	PARKING (spaces)
Existing 1982				
East	0.2360	0.1412	2223	5601
West	1.5970	0.1106	3922	13269
Sub-Total	1.833	0.2518	6,145	18,870
Cumulative-Total	1.833	0.2518	6,145	18,870
1983 Additions				
East	.00557	0.1040	500	1568
West	.06875	0.0046	236	659
Sub-total	.07432	0.1086	736	1227
Cumulative-Total	1.9073	0.3604	6,881	20,097
1984 Additions				
East	—	—	—	—
West	0.0743	0.0037	—	516
Sub-Total	0.0743	0.0037		516
Cumulative-Total	1.9816	0.3641	6,881	20,613
Post '84 Additions				
East	0.0696	0.0019	340	271
West	0.0177	0.0019	386	169
Sub-Total	0.0873	0.0038	726	430
Cumulative-Total	2.0689	0.3679	7,507	21,043

Note: (1) These estimates do not account for building demolitions or removal of parking areas.

Source: City of Ottawa, Central Area, Current Projects, August, 1982.

EXHIBIT 1.8: LAND USE AND EMPLOYMENT - DISTANCE FROM STUDY BLOCKS (1)

DISTANCE FROM STUDY BLOCKS	OFFICE (000's sq.m.)			RETAIL (000's sq.m.)			EMPLOYMENT (No. employees)			PARKING (Spaces)		
	EXISTING	PROPOSED	CUMULATIVE TOTAL	EXISTING	PROPOSED	CUMULATIVE TOTAL	EXISTING	(2) PROPOSED	CUMULATIVE TOTAL	EXISTING	PROPOSED	CUMULATIVE TOTAL
1. - 1 block	73	—	73	31	—	31	3,350	—	3,350	295	—	295
2. - 2 bl.	708	48	829	34	2	68	23083	1379	27812	3715	428	4418
3. - 3-4 bl.	555	76	1460	34	8	110	20510	2400	50722	5752	395	10585
4. - 4 + bl.	117	35	1612	1	1	112	2699	1044	54465	2345	270	13200

Notes: (1) These estimates do not account for building demolitions or removal of parking spaces.

(2) Employment in proposed buildings calculated by dividing total proposed space by current average space per central area employee (374 gross sq. feet per employee in 1981).

Sources: City of Ottawa, Central Area Data Bank, 1982;
City of Ottawa, Current Projects, Central Area, August 1982.

EXHIBIT 2.2: STUDY BLOCK CHARACTERISTICS, 1981

CHARACTERISTICS	BANK/O'CONNOR (sq. m.)	O'CONNOR/METCALFE (sq. m.)
Floor space	28,047 (gross)	28,372 (gross)
Retail space	11,027	10,526
Office Space	4,645	10,247
Vacant Space	4,311	2,044
FSI	2.8	2.9
Employment (1)		
Retail	30	33
Office	14	37
Space (Sq.m.) Per Employee (2)		
Retail	34	30
Office	30	25

Notes: (1) Includes full and part-time employees
(2) Excludes vacant space

Source: City of Ottawa, Central Area Data Bank, 1982

EXHIBIT 2.5 - SPARKS STREET FRONTAGE CHARACTERISTICS

S.I.C. Category	Number of Tenants	Total Floor Space (sq.m.)	Average Floor Space/Tenant (sq.m.)	Number of Employees
BANK/O'CONNOR BLOCK				
vacant space	2 vacant spaces	3,130	1,565	—
general merchandise	3	5,889	1,963	108
retail (clothing/shoes)	12	2,262	188	61
jewellry, tobacco, retail not classified elsewhere)	6	1,716	286	25
banks and brokerage	1	321	—	15
amusement/recreation services	1	1,166	—	3
business services	3	384	128	17
personal services	2	568	284	6
non-Canadian incorporated companies	1	650	—	—
O'CONNOR/METCALFE BLOCK				
vacant space	2 vacant spaces	910	455	—
general merchandise	1	5,695	—	159
retail (clothing/shoes)	1	298	—	4
jewellry, tobacco, retail not classified elsewhere	3	529	176	12
banks and brokerage	5	2,686	537	100
medical	1	36	—	1
business services	16	3,126	195	138
personal services	1	204	—	4

STANDARD INDUSTRIAL CLASSIFICATION CODES (1970)

EXHIBIT 5.4: SITE PLANNING CONSIDERATIONS

	BANK/O'CONNOR	O'CONNOR/METCALFE
1. General Block Characteristics		
- Block Length	163m.	161m.
- Block Depth	61m.	61m.
- Block Area	9854 sq. m.	9761 sq. m.
- Elevation Sparks	72,3m. (varies)	76m. (varies)
- Elevation Queen	72m. (varies)	73m.
2. Zoning/Planning Constraints		
- Land Dedication for roadways	91cm. on all streets	91cm. on all streets
- Sidewalk Requirements	2.4m. + 1.5m.ground level setback	same
- Setbacks	1.5m. ground level only	same
- Permitted Heights (Pre-holding Bylaw) - Sparks	59m.	59m.
- Queen	60m.	62m.
- Access to Parking	Queen only	same O'Connor
- Service Access	Queen or O'Connor	Queen, or Metcalfe
- Elevated Pedestrian System Requirements	5.2 m. above travel way; 4.6 m. width, 2.7m. height; enclosed	same

EXHIBIT 5.15: SITE CHARACTERISTICS - PARTIAL ASSEMBLY OPTION

Zoning Policy	Site	Floor to Floor Height	Gross Floor (sq.m.)	F.S.I.	Site Area (sq.m.)
45 feet/26 degrees	1W	3.7m	14606	4.86	2273
	2W	3.7m	14049	5.06	2237
	3W	3.7m	10152	4.97	1673
	4W	3.4m	2767	3.8	656
	5W	3.4m	7838	7.07	998
	1E	3.7m	23098	5.07	3717
	2E	3.7m	14558	4.89	2440
45 feet/38 degrees	1W	3.7m	18473	6.28	2273
	2W	3.7m	18340	6.79	2237
	3W	3.7m	12681	6.83	1673
	4W	3.4m	3313	4.22	656
	5W	3.4m	8865	8.0	998
	1E	3.7m	29885	6.71	3717
	2E	3.7m	18427	6.31	2440
C-2/8.0	1W	3.7m	23162	8.0	2459
	2W	3.7m	21339	8.0	2237
	3W	3.7m	15771	8.0	1673
	4W	3.4m	5828	8.0	656
	5W	3.4m	8865	8.0	998
	1E	3.7m	35196	8.0	3717
	2E	3.7m	22994	8.0	2440

EXHIBIT 5.16: SITE CHARACTERISTICS - FULL BLOCK ASSEMBLY OPTION

Zoning Policy	Site	Floor to floor Height	Gross floor Area (sq. m.)	F.S.I.	Site Area (sq. m.)
45 feet/26 degrees	West Block	3.7m.	57049	4.75	9854
	1E	3.7m.	23098	5.07	3717
	2E	3.7m.	14558	4.89	2440
Total (FSI average)			94704	4.8	16011
45 feet/38 degrees	West Block	3.7m.	71623	6.08	9854
	1E	3.7m.	29885	6.08	3717
	2E	3.7m.	18426	6.71	2440
Total (FSI average)			119934	6.2	16011
C-2/8.0	West Block	3.7m.	92667	8.0	9854
	1E	3.7m.	35196	8.0	3717
	2E	3.7m.	22994	8.0	2440
Total (FSI average)			150857	8.0	16011

Note: FSI calculations are based on the City's Bylaw definition, which excludes core space (elevators, services areas, etc.).

EXHIBIT 7.1: RESIDUAL LAND VALUES PER SQUARE METRE

ASSEMBLY OPTION/PARCEL		45 feet, 26 degrees	45 feet, 38 degrees	C-2/8.0
1. Partial Assembly				
Parcel -	1W	$1066	$2078	$3638
	2W	517	1862	3068
	3W	635	1830	3197
	4W	377	915	2260
	5W	1808	3036	3703
	1E	732	2045	3262
	2E	710	1701	3068
Average (weighted by site Area)		797	1970	3240
2. Full Block Assembly				
Parcel - West Block		495	1647	3100
	1E	732	2045	3262
	2E	710	1701	3068
Average (weighted by site Area)		581	1744	3132

EXHIBIT 7.3: RESIDUAL LAND VALUES ASSUMING CURRENT RENTAL RATES

Zoning Policy	Weighted Average Residual Land Values (per sq.m.)
45 feet/26 degrees	- $1055
45 feet/38 degrees	- 431
C-2/8.0	+ 237

EXHIBIT 8.15: ESTIMATED LONG TERM - RETAIL IMPACTS (1991)

WITHOUT RIDEAU CENTRE

ZONING OPTION	SALES PER SQ.M. RETAIL SALES PER SQ.M.	ADJUSTED FOR EMPLOYMENT EFFECT	ADJUSTED FOR QUALITY/ ENVIRONMENT EFFECT	WITH RIDEAU CENTRE FINAL SALES PER SQ.M.	FINAL SALES PER SQ.M.
	(1)	(2)	(3)	(4)	(5)
Existing Development	$1416.15	N.A	N.A	$1416.15	$1179.33
45ft./26 Degree	1382.99	1519.91	1382.99	1519.91	1299.68
45ft./38 Degree	1382.99	1561.36	1382.99	1561.36	1341.12
C-2/8.0	1382.99	1616.79	1455.33	1455.33	1235.09

1. Retail sales estimated from City of Ottawa model. These are average retail figures for the core area and have been adjusted upward by 10% to account for existing high retail attractiveness and the Mall environment.

2. Employment effect estimated based on analysis in subsection 8.3.

3. It is assumed for the quality/environment effect that a pleasant Mall environment contributes about 10% to total retail sales. Given the potential for the C-2/8.0 option to negatively affect the Mall environment a 10% decrease is assumed for this option. This effect is already taken into account for the remaining options (see note 1 above).

4. The employment related and quality/environment effects are assumed to be absolute effects and are calculated accordingly when accounting for Rideau Centre impacts.

METRIC CONVERSION

OF

APENDIX B TABLES

CONSTRUCTION COSTS ASSUMPTIONS (PER SQ.M.)

USE	C-2/8.0 BASE	BYLAW 45 FT/38 DEGREES COST	% CHANGE	45 FT/26 DEGREES COST	% CHANGE
Overall Cost	$695.48	$748.22	+7.6	$814.64	+17.13
Office	687.94	738.86	+7.4	803.66	+16.82
Retail	770.18	821.10	+6.61	885.90	+15.02
Parking					
1 level(204 SM)	652.31	652.31	—	652.31	—
4 levels(204 SM)	487.19	487.19	—	487.19	—

EXPECTED NET REVENUES PER SQUARE METRE

Space Quality	Space Type Office	Retail
prime	$248	$269
average	215	215
sub-average	183	161

RETAIL ASSIGNMENT BY PARCEL

Parcel	Retail Square Metres
1W	3203
2W	1765
3W	1421
4W	474
5W	769
1E	4998
2E	948
Full Block	14499

TOTAL PROPOSED BUILT SPACE (SQ.M.)

	Partial Assembly	Full Block - West Partial Assembly - East
Zoning Policy	Total Space	Total Space
45 ft./26 degrees	87067	106461
45 ft./38 degrees	109784	133096
C-2/8.0 FSI	133154	167631

AVERAGE SPACE PER EMPLOYEE

Retail	Office
25.0 sq.m.	31.9 sq.m.

Source: Updates of the Central Area Data Bank, 1981, City of Ottawa

EXHIBIT B1: RETAIL SPACE - QUALITY ASSIGNMENT (SQ.M.)

SITE	RETAIL SPACE	PRIME	QUALITY AVERAGE	SUB-AVERAGE
1W	3203	1236	864	1644
2W	1765	743	-	1022
3W	1421	827	-	595
4W	474	474	-	-
5W	769	465	305	-
1E	4998	1570	1784	1644
2E	948	613	-	334
	13578			
Full Block	14499	4645	4645	5209

EXHIBIT B2 : OFFICE SPACE ASSIGNMENT - 45/26 DEGREES (SQ.M.)

SITE	FLOOR SPACE	RETAIL SPACE	TOTAL OFFICE	PRIME	QUALITY AVERAGE	SUB-AVERAGE
7W	10152	1421	8731	4103	3754	873
8W	2767	474	2293	-	2293	-
10W	7838	769	7069	7069	-	-
2W	14049	1765	12284	5282	5405	1597
1W	14606	3203	11403	11403	-	-
1E	23098	4998	18100	12670	3620	1810
2E	14558	947	13610	6397	7783	1810
Full Block	57049	14499	42550	23970	13935	4645

Assumptions: 10W - all prime
8W - average
7W - 47% prime/43% average/10% sub-average
2W - 43% prime/44% average/13% sub-average
1W - all prime
1E - 70% prime/20% average/10% sub-average
2E - 47% prime/43% average/10% sub-average

EXHIBIT B3 : OFFICE SPACE ASSIGNMENT 45/38 DEGREES (SQ.M.)

SITE	FLOOR SPACE	RETAIL	TOTAL OFFICE	QUALITY PRIME	QUALITY AVERAGE	QUALITY SUB-AVERAGE
7W	12681	1421	11260	6633	3754	873
8W	3113	530	2639	-	2639	-
10W	8865	769	8096	8096	-	-
2W	18340	1765	16575	9574	5405	1597
1W	18473	3203	15270	12799	2471	-
1E	29885	4998	24887	19457	3620	1810
2E	18427	948	17479	7886	7783	1810
Full Block	71623	14499	57124	38544	13935	4645

Assumptions: 10W - prime
8W - average
All other sites - average and sub-average stay constant & prime increases

EXHIBIT B4 : OFFICE SPACE ASSIGNMENT C-2/8.0 (SQ.M.)

SITE	FLOOR SPACE	RETAIL	TOTAL OFFICE	QUALITY PRIME	QUALITY AVERAGE	QUALITY SUB-AVERAGE
7W	15771	1421	14349	9722	3754	873
8W	5828	474	5354	-	5354	-
10W	8865	769	8096	8096	-	-
2W	21339	1765	19574	12572	5405	1597
1W	23162	3203	19959	19925	-	-
1E	35196	4998	30198	24768	3620	1810
2E	22994	948	22047	12454	7783	1806
Full Block	92667	14499	78168	59588	13935	4645

Assumptions: Corner lots or portions of buildings with greater than 2 side windows exposure - prime
All other space - average and sub-average constant, prime increases
Full block - prime 76%

APPENDIX G

STUDY TERMS OF REFERENCE

M.008-018-01/82

REQUEST FOR PROPOSALS

SPARKS STREET ECONOMIC STUDY

File: SD-4208-27/521

Introduction

In the Study Area defined below, the existing zoning allows building heights of up to 192 feet with an F.S.I. of (8.0) (Appendix 1) with no setback requirements. (See Attachments 1 and 2, Maps A and A1). The proposed zoning, which is partially based on an environment study completed in February, 1980, reduces the allowable building heights of new development to a maximum of 45 feet measured at Sparks Street increasingly by a 26 degree angle requirement to Queen Street. (See Attachment 3, Map B)

This proposal raises questions on the viability of new development or redevelopment especially in terms of development costs and revenues. This study shall therefore analyze a number of development scenarios as outlined below to identify the financial impact of the proposed by-law amendments.

Study Area

There are 21 parcels of land with 3 vacant sites in the two City Blocks on the south side of Sparks Street between Metcalfe Street and Bank Street. All these sites individually and in an amalgamated form shall be studied in the context of the entire Sparks Street Mall (from Elgin Street to Lyon Street) (see Map E) as well as in the context of the Ottawa Central Area (see Attachment 7, Map F). Please note that for the purpose of this study, the heritage buildings are not to be given special consideration in the analysis since their inclusion would not permit analysis of the effect of only the various height envelopes as the main parameter.

Terms of Reference

1. At the outset, there are two land ownership patterns (scenarios) for which future development shall be studied. These are:

   1a. The existing land ownership pattern consisting of several parcels of land and several different owners. (See Map C, Attachment 4).

   1b. Recognizing that land assemblage could result in various property configurations, three potential configurations and three owners is the other scenario (see Map D, Attachment 5).

2. Each of the above ownership patterns shall be analyzed and studied under the assumptions of:

   2a. Highest return on investment under the previous C2(S.1. zoning).

   2b. Highest return on investment under a C2 use with proposed 45'/26° height envelope, commenting on the impact which the height envelope has on the subsequent buildings' marketability and viability in the market place and other pertinent factors vis-a-vis subsection 3c. below.

   2c. Renovation of the existing structure.

INITIALS OF BIDDERS

2d. A fourth assumption, chosen by the Planning Director, which would provide for the analysis of some combination of alternatives 2a, 2b and 2c above, if in his opinion such is warranted.

2e. An evaluation of the residual land value of the sites under 2a to 2d inclusive, all other assumptions being equal.

3. An in-depth economic study of the above scenarios shall be undertaken. This study shall include, but not be limited to, the following economic and financial factors:

3a. Development costs of the various types and sizes of buildings as specified above; e.g., per square foot and total construction costs, land costs, carrying charges, other initial/capital costs.

3b. Operating and maitenance costs associated with various forms of development as outlined above.

3c. Net leasable space associated with each type of development using the Building Owners and Management Association's Standards (BOMA), an assessment of the type of tenants most likely to locate in these buildings, a range of most likely rents to be generated; all leading to the estimated per square feet as well as total revenues associated with each and every type of development as outlined above. This step shall also include a quality assessment of the different spaces from the tenants' point of view under different market conditions.

3d. The comparison shall be based on a return on investment economic indicator.

3e. An evaluation of the effect on land value for land fronting Sparks Street and the land fronting Queen Street.

4. 4a. An analysis of the extra costs of providing services by the City of Ottawa and the RMOC to these various forms of development, over and above existing costs.

4b. An analysis and comparison of all types of municipal tax revenues to be generated by the various forms and sizes of development.

5. 5a. An estimation of the total number of employees that the space in the different types of development will accommodate.

5b. A review of literature and existing development examples dealing with the importance of micro-climate on retail activities.

5c. An estimation of the impact of the difference in employment (calculated in 5a.) on retail business on the Mall (See Attachment 6, Map 3).

Final Product

Conclusions and detailed analysis shall be in a report which the consultant will present in ten copies to the City of Ottawa. All work shall be carried out by the consultant; the City of Ottawa will provide relevant studies and data as available.

Study Period

All work shall be completed and reports submitted to the City of Ottawa in not more than four months following the signing of an agreement between the consultant and the City of Ottawa. Detailed work schedule to be determined after the selection of the consultant.

INITIALS OF BIDDERS

POOR

QUALITY

ORIGINAL